



Pulp and Paper Magazine

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PULP AND PAPER MAGAZINE

MONTREAL AND TORONTO

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One effect of the high insurance rates levied on the St. Lawrence route by the marine insurance interests has been the diversion of much of the export lumber and timber trade from Quebec and Montreal to Portland and Boston. Now that these rates have been reduced to a reasonable scale, this trade will return to its former channels, with some effect on the pulp industry.

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J. R. Booth has taken out a permit for the erection of a brick building in Head Street at the Chaudiere, Ottawa. We understand it is for the big pulp mill, the foundation of which has long been in progress on the site of the old McKay mill. The structural work will proceed at once.

The North River Pulp & Lumber Co., of Baddeck, N.S., have plans for a pulp mills costing \$750,000. The company has a lease of all the crown lands not yet granted in Victoria County, and some in Inverness. It has built saw mills and barking mills of a capacity of 70 cords a day, but at present the pulp wood is shipped to supply pulp mills in Maine. Boston and New York men are principal owners.

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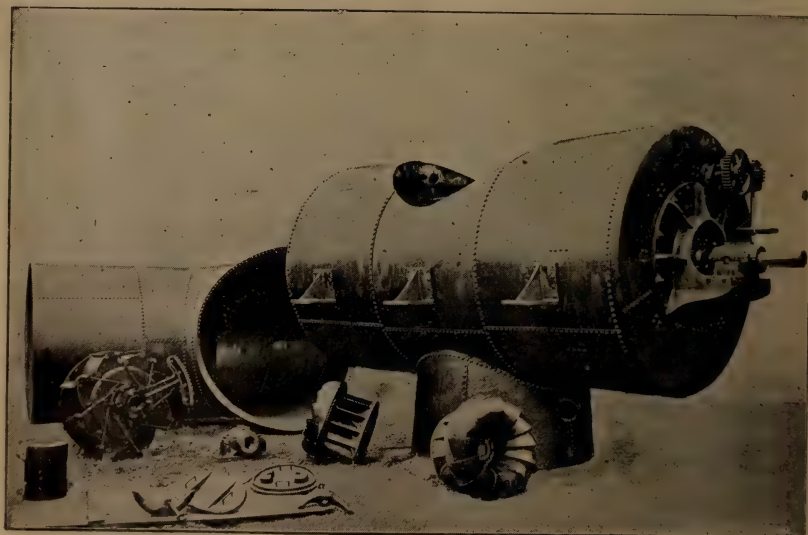
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VOL. 1.—NO. 1.

TORONTO, MAY, 1903.

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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

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THE BRITISH PAPER INDUSTRY AND ITS RELATION TO CANADIAN TRADE.

Wm. Dyson, secretary of the Amalgamated Society of Paper Makers, an association of paper mill operatives, who was selected to represent the paper trade on Alfred Moseley's British industrial commission to the United States, recently made his report, and the publication of the report being followed by the annual meeting of the Paper Makers' Association in London, the situation thus revealed must set British paper mill owners to thinking deeply on the outlook. What they will do is a question of live interest to Canadian pulp manufacturers, because upon the capacity of British paper mills to absorb our pulp exports depends the prosperity of this branch of our trade; and the condition of the trade in the Mother Country will

also affect our domestic paper industry, directly and indirectly.

Reviewing the whole situation it is important for the Canadian manufacturer to note that during 1902, the British paper manufacturer hardly more than held his own in foreign markets. While he did not make any advances in foreign markets, his Scandinavian, German, Dutch and French competitors did—and some of them invaded the British market with new lines of goods. During 1902 no less than 6,471,688 cwt. of paper and boards valued at £4,537-632 were imported into Britain, an increase of nearly £200,000 on 1901. The countries chiefly supplying this paper were Sweden, Norway, Holland, Germany, Belgium, and the United States. The United States contributed less of this trade in 1902 than in 1901 by £120,512, a falling off due to the demands of the U. S. home market; but Germany made up about all the U. S. lost, as the German exports to Britain increased by £116,262. Some of these imports were re-exported. The total exports were 1,080,799 cwts. valued at £1,671,152 in 1902 or an increase of only £2,575 over the previous year. The items in which the British manufacturer made the chief advances were writing and printing papers and envelopes. The British paper manufacturer is fast losing his hold on the Australian market, the decrease last year being

£91,906; though this loss was partly made up by an increase in the South African market. The British paper mills in 1902 used wood pulp to the amount of 525,811 tons, valued at £2,398,226, esparto grass to the amount of 198,292 tons worth £717,854, and rags weighing 18,884 tons, valued at £173,823. These quantities were greater than in 1901, but the values were less, showing that the prices and profits of the manufacturer were less.

These results are satisfactory to the merchant, but not to the British manufacturer, and we are not surprised that the council of the Paper Makers Association regard with concern the fact that nearly 200,000 tons of printed and unprinted papers are imported into Great Britain annually. The report of Council says: "If the successful competition of the foreign manufacturer is due to improved methods in the internal administration and working of their paper mills, those paper makers in this country who are still able successfully to meet this competition should place their experience in the hands of the Council, so that an organized attempt may be made to keep foreign paper out for the general advantage of the home trade."

On the political aspect of the trade question, the report goes on to state: "As regards the fiscal policy of this country there seems little chance of any alteration, but having regard to the fact that the Colonial Conference which met last year adopted the principle of preferential trade within the Empire, and that Canada, Australia, New Zealand, the Cape and Natal, are prepared to accord preferential treatment to articles manufactured in the United Kingdom, it is, in the opinion of the Council, desirable that paper makers should make special

efforts to obtain the raw materials from such colonies as Canada and Newfoundland, and to endeavor to find larger markets for their own manufactured products within the Empire."

Turning now from the statistics of the trade and the formulated opinion of the Paper Makers' Association, we come to the report of Mr. Dyson, and here we will find some, at least, of the reasons why British paper makers are not making the progress of their competitors. The report is too long to give in full, but Mr. Dyson's conclusions are that the progress the United States manufacturers have made is due, first, to the better education of the average man; second, to the possession of large water powers and almost unlimited supplies of wood for pulp making; and third, to the better mechanical equipment of the mills. On the last point he says: "When we leave the natural resources and go into the details of manufacture, there is no doubt that we are lagging behind, the mechanical equipment of the average American mill being superior to the average mill in this country, not only in the shape of labor saving machinery, but also in the machinery actually necessary for paper making, the idea being that from the time the raw material enters the mill to get as much made into the finished article in the shortest possible time." He then goes into details, some of which will be quoted in next issue.

In a speech at the annual meeting of the association, Mr. Dyson explained that he referred to the average of United States machinery as being superior to British, but he admitted that some types of British machinery were equal to any across the Atlantic. With this admission in favor of some classes of British machinery it seems strange that

more of it is not in evidence in Canadian mills, since the preferential tariff in favor of British manufacturers has been long enough in operation to have enabled them to gain a large footing in the Canadian market. What appears then to be wanted is a commissioner representing British pulp and paper machinery makers, to visit Canada, study the conditions of this market, find out what is wanted and adapt themselves to supplying this want in heavy machinery such as is not made in this country. Meantime they will probably find that in such lines as Canadian machine shops have undertaken to produce, we are up to date; but there are certain classes of heavy machines that may not be made in Canada for some time, and there is no reason why British makers adopting methods required here should not have a large share of Canadian trade. Then by introducing into their mills the best features of those of United States, there is no reason why British paper mills should not recover all the ground they have lost. But it is only the truth to say that the British workman as well as the British manufacturer will have to rouse himself and leave his beer barrel, for not only Mr. Dyson, but others of Mr. Moseley's commission see that the relative sobriety of the workmen all over the American continent is a cause of the industrial advances made in this quarter of the world.



PULP AND PAPER MAGAZINE.

(From the Prospectus.)

If any one asks why the Pulp and Paper Magazine of Canada comes into existence, we give answer that such a magazine is inevitable. Canada is destined to be the greatest pulp and

paper manufacturing country in the world, and naturally a country which leads the world in a special industry will require an organ of information and opinion to represent that industry. Canada possesses both the raw material for the trade and the facilities for manufacturing pulp and paper to an extent unequalled by any nation. Spruce is the best of all woods for the production of pulp, and while the spruce of Canada is admitted to be unsurpassed by that of any other region of the earth, the available quantity is probably equal to that of all other countries combined, being estimated by the Dominion Statistician at 450,000,000 acres. Cheap and well distributed water supply and water-power are essentials for these industries, and in this respect also the advantages of Canada are pre-eminent. There are thousands of water-powers in the Dominion still unutilized, hundreds that have not been seen by the eye of a white man, and it is calculated that the total water-power of Canada is 40 per cent. of the entire water-power of the world.

An intelligent people, who are rapidly increasing their manufacturing facilities in many directions and who are fast developing their foreign trade, cannot fail sooner or later to realize what nature has thus placed within their reach. An earnest of what is in store for the Canadian pulp and paper industry is given in the following figures of the trade of the last few years.

It was only in 1890 that the exports of pulp and pulpwood from Canada were considered of sufficient importance to give them a separate classification in the Trade and Navigation returns. In that year the exports of pulpwood were valued at \$80,005 and those of pulp at \$762,280. The following table shows the

risen until, in the last fiscal year, ending June, 1902, the Canadian exports of pulp-wood amounted to \$1,315,038, of which \$120,445 went to Great Britain and \$1,194,593 to the United States; while in the same year the exports of pulp reached a total of \$2,046,398, of which \$818,580 went to Great Britain, \$1,170,400 to the United States, \$40,965 to France, and the balance to European countries, Australia and China. It is estimated that Canada will in 1903 supply 25 per cent. of the requirements of the British pulp market. In addition to these exports, the paper and pulp mills of Canada now supply the home market to a greater extent than ever before.

These facts justify the existence of the Pulp and Paper Magazine, and we are glad to be able to say that the subscriptions and advertisements already received in advance of this first issue show that our faith is well founded.



FIBRES FOR PAPER MAKING

BY EARNSHAW BRADLEY, C.E., TORONTO.

Owing to the large consumption of spruce for making paper, and its growing scarcity in the United States and near some of the mills in Canada, which has caused a steady increase in price, a lookout is being kept up for new fibres to replace this wood.

The list of materials that have been proposed for use in making paper is very large, ranging from woods to sea weed, and it is desirable that those who are not intimately acquainted with the requirements and mode of testing plants, etc., for such a purpose should have some data to go upon, so that they may be enabled to determine the probable usefulness of any such material they may come across. To such the following information may be useful.

Cotton and linen rags formerly were the principal materials from which paper was manufactured, and any material that

it is proposed to employ for this purpose has to go through the preparatory processes that they have gone through—namely sorting, washing, boiling and usually bleaching, if for white paper.

The average yield of straw is about 33 per cent. in white paper of the original dry weight, and spruce wood when boiled with sulphurous acid gives about 50 per cent of unbleached fibre and when boiled with caustic soda about 45 per cent. The yield of pulp from a given quantity of wood, plants, etc., also varies somewhat according to the length of time it is boiled and the treatment it is subjected to.

Many plants yield excellent fibre, but are not available on account of the high cost of the raw material or the cost of manipulation in making them into paper.

For instance "wild rice," which grows plentifully in some parts of Ontario, yields an excellent fibre but it is too costly in the raw state, on account of the difficulty of harvesting it. Also "Therbe a lieu," which grows very abundantly on the St. Lawrence below Montreal, yields a fibre nearly equal to Esparto, but is too costly to manipulate at the present time and has been succeeded by sulphite fibre in newspaper where it was used for giving strength.

The loss in the manufacture of fibres is to paper varies from 50 per cent. when using flax, tow and hemp to 10 per cent. when using wood pulp, and the per cent. of bleaching powder employed for bleaching varies from $2\frac{1}{2}$ per cent. with rags to 18 per cent. with soda spruce pulp, so that it is generally advisable to have the material tested by a chemist who has had experience in this work, but at the same time a good idea of the value of a fibre may be obtained by carefully weighing a sample of the fibre in the state and form in which it is bought and then washing it to get rid of any dirt, etc., sticking to it. After this it should be partially dried, and boiled in a 10 per cent. solution of caustic soda for 15 minutes. It should be then drained and washed until all traces of the soda have been eliminated, and then drained and dried between

sheets of blotting paper. After this it should be bleached with a 10 per cent. solution of bleaching powder, washed again, and air dried. The weight of the product will then give approximately the weight of bleached fibre you can obtain from the weight of the raw fibre tested.

The caustic soda and bleaching powder used should always be of a standard strength and distilled water used so as to make the results as accurate as possible.



CANADA AND HER FOREST ASSETS.

BY GEORGE JOHNSON, F.R.S.S., DOMINION STATISTICIAN.

Most countries have been busy during several years taking stock of their forest wealth. All have come to the conclusion that scientific care is needed for the conservation of the resources of the forests of the world. Not alone has there been an enormous drain upon these forests in the past, but the drain goes on at an ever-accelerating rate, notwithstanding the substitution of iron and steel in ship building, bridge building, house building and other lines of industry.

There are now but seven wood-exporting countries. All the others are importers of forest products. Austria-Hungary, Canada, India, Norway, Sweden, Russia, and the United States have to supply their own wants and bear the burden of supplying, in part large or small, the wants of the other countries. I do not mean that there are not many supplies of wood picked up from various countries, helping to increase the main sources of supply. There are the West Indian Islands, Mexico, Central America and the countries of South America, which contribute, taken together, somewhat more of wood and products of wood to the world's available total for general distribution than they receive from that total. British Honduras supplies mahogany; other countries, other special woods. But these may be ranked as luxuries with which at a pinch the world could do without.

Practically the economic timber supplies available for general distribution are stored up in the forests of the seven countries named.



Some of the importing countries appear to be improving in their ability to supply themselves. Thus France had to import, over and above her own available supply, and over and above those exports of wood which from one cause and another, chiefly from contiguity of territory, she made, no less than thirty-four million dollars worth of forest products in 1881. By 1891 this 'had increased to thirty-nine and one-third million dollars' worth. In the decade, 1891—1901, she decreased her net imports to twenty-five million dollars, the amount of her net import in 1901. Social conditions in France have changed little in ten years, so that we are driven to the conclusion that the decrease is largely due to the increased ability of France to supply her own wants from within herself, through a well applied system of forestry by which the destructive forces preying upon the forest area have been more than held in check by the assistance given to the protective and regenerating forces. To strengthen the belief that the remarkable change the statistics suggest is due to the development of forestry, are the facts: 1st, that the forests of France have of late years increased in area; 2nd, that they have increased in productiveness, and 3rd, that the planting of the dunes carried on in a systematic manner on an extensive scale has turned into a source of profit what was formerly a cause of destruction.



In other countries the statistics show a general increase in the demand for forest products, indicating an increased demand upon the few countries that have a surplus of products of the forest to distribute among their necessitous brother-nations. In Germany forestry has attained it is said, its highest perfection. The United States has been indebted to Germany for a succession of

very able men whose trained minds have grappled with the problems of silviculture, as they have presented themselves in the New World. Yet, notwithstanding that the forest area of Germany is equal to one-quarter of the whole area of the country or 34,400,000 acres, and is skilfully administered, the demand for forest products has increased so greatly that the imports of these products by Germany amounted in 1901 to sixty million dollars over and above the exports of these products, a sum nearly four times the excess of Germany's imports over exports in 1881. Such has been the revolution wrought in 20 years that Germany alone in spite of the great reserves of forest from which to draw supplies for its own internal wants, drew in 1901 upon the world's general surplus to such an extent that the surplus exports of Canada and the United States together were only four million dollars more than the value of the drawings from the common surplus stock Germany was compelled to make in order to satisfy her wants.

The United Kingdom requires the largest share of the exportable surplus of the wood-supplying countries. Its demands have gone on increasing at a great rate. In 1901 it required one hundred and thirty million dollars worth of wood products for internal consumption. That is just \$3.15 per head of the population of the United Kingdom. In 1891 the requirements of the people in this line reached \$2.15 per head, and in 1881, their demands upon the forest reserves of the world were equal to \$2.03 per head. The population had increased 10 per cent.; the demand for wood and its products increased 60 per cent. within a single decade.

If the reports of forestry experts are a correct diagnosis of the condition, it is plain that though the United States still stand high among wood-exporting countries, the time is not far distant when, as to this continent, that country must cease to be counted on to supply any appreciable percentage of the world's demands for wood, outside of

supplying its own wants. That these reports are based upon solid data appears to be an incontestable fact, since in the space of twenty years, notwithstanding the consolidation of interests which has been produced by the rapid development of transportation facilities and the consequent grasping of its own markets, border and other, the United States has been forced by its forestal circumstances to rely more and more upon the products of Canadian forests, the imports from Canada having increased 45 per cent. since 1881.

The other wood-exporting countries show the increasing strain there is upon their resources. Thus Austria-Hungary exported \$25,300,000 worth of woods in 1881, and twenty years later (1901), the export was forty million dollars, an increase of 58 per cent. Norway's increase was from \$10,207,000, in 1881, to \$19,000,000, in 1901, an augmentation of 86 per cent. Sweden's increase in the same period was from \$26,650,000 to \$40,000,000, an increase of 50 per cent.

Of Russia, whose increased export in twenty years is equal to 26 per cent., it is said that her gradual deforestation is attracting increased attention throughout the Empire, and the Forestry Society, as well as the Forest Department of the Ministry of Agriculture and Domains, are discussing means for regulating the consumption of timber and for propagation. It is of course difficult to obtain accuracy in statements of area in such a country as Russia. But in 1892 an official report gave the area of forest in Russia at 498,200,000 acres, and in 1901 an official report gave the forest area as 464,548,000. This is a reduction of over 7 per cent. in ten years, and is sufficient to give cause for the increased attention mentioned.



There are some countries which twenty years ago did not appear among the wood-exporting countries, but which since 1881 have reversed their positions. Among these the most hopeful is British India. A score of years ago the net import of woods into India had a value of

nearly \$4,000,000. In 1901 the tables were turned and the net export was nearly three and one-half million dollars.

It is in India more than in any other country that the benefits of scientific forestry have been most marked.

France, as we have seen, has reduced her net imports very considerably during twenty years and especially during the last half of the twenty. Her system of conservation of forests has produced good results. Still she is compelled to import largely of forest products. Germany, notwithstanding the scientific efforts of her forestry experts to preserve the forests of the country, goes on importing woods at an increasing rate. India, on the other hand, from being an importing country, has, within twenty years become an exporter and is a good illustration of what may be done by an intelligent application of scientific principles to the forest areas of a country. In 1877, the demarcated forest area of India was only 17,705 square miles. By 1878 the area was raised by operations in the central provinces to 40,425 square miles. In 1901 the area thus set apart rose to 150,156 square miles. As these figures show, the reservation of forest tracts has been prosecuted with great energy, thus accounting for the remarkable change from a wood-importing to a wood-exporting country, which India has experienced.

With the exception of Roumania, where a comparatively small surplus import in 1881 has been changed to a small surplus export of wood, I do not know of any other country which from being a wood-importing country has become, within the last twenty years a country with an exportable surplus of forest products. In the case of India, it is not an exceptional circumstance produced for a single year through some curious or unusual freak of trade; it has been the trend of the trade since 1890, when for the first time the exports in this line exceeded the imports, continuing to do so ever since with the exception of one year (1892).

This rapid review emphasizes three points; 1st, the great and increasing drain there is upon the forest reserves of every country; 2nd, the likelihood that some of the exporting countries will be compelled to withdraw their quota to the general stock available for distribution, either because of the exhaustion of their reserves or because of the increasing internal demand upon them, or because of a union of both experiences; 3rd, that scientific forestry is worth adopting and applying with vigor because of the good results that have followed its adoption in such countries as France and India.

In the United States a long step in advance has been taken in connection with reafforestation and the preservation of existing forests. The 1901 Year Book of the United States Department of Agriculture gives a list of thirteen States which have offices for forest work, and of twenty-one forestry associations, whose object is to arouse public interest in the importance of the subject.

Besides these there were three schools of forestry and forty-eight institutions offering instruction in forestry.

In addition to these evidences of "waking up," I find in the report of the United States Secretary of State for Agriculture, the fact enlarged on that the demands from private sources for plans were far more numerous than the resources of the Division of Forestry could meet. "The total requests for working plans amounted at the end of the fiscal year 1901 to 51,200,000 acres, of which about two and a half million acres were for private lands." "Public interest in forest matters is just now not only keener and wider than at any time heretofore, but it is growing with a rapidity altogether without precedent." I have no doubt that the forthcoming report for the year 1902 will bear witness to the continuation of this most favorable condition of affairs.

A good deal has been said about the Biltmore Forest, the success of which has done much to stimulate interest in

the true methods of managing forests. The experiments of Cornell University are under the control of Mr. Fernow, and that is equal to saying that they are in the best of hands, for there is no clearer-headed exponent of scientific forestry. Just a sentence or two from him to show what forest management means. "Forest management implies that the forest is to be continued as such; just as agriculture has in view the continued use of the soil for food crops, so forestry has in view the continued use of the soil for wood crops. Forestry is the business and art of producing wood crops and deriving a revenue therefrom; it implies, therefore, the harvesting of the mature crop in order to make room for a new young crop. The forester, therefore, is, in part, a lumberman, the difference being mainly in that the lumberman merely cuts the virgin natural forest without any reference as to what becomes of what he leaves; he works for his present pocket interest without conscious regard to the future. The forester cuts it with a view of securing a second, third and continuous crop; he works for the present and the future; he must be willing to forego some of the present profits which the lumberman does not take into consideration. The lumberman compares to the berry-picker in the wild woods; the forester to the market gardener, applying skill to the production of his crop."

Recently, Mr. Harriman has set to work systematically to develop a large estate he owns in New York State, about 20,000 acres, of which 15,000 acres are in woodland. This is an interesting experiment and a few details may be of interest. During last winter Mr. Harriman applied to the Bureau of Forestry in Washington for assistance in the management of the woodland part of his estate. He wanted a working plan. A professor of Yale Forest School offered to send, instead of the one or two experts the Washington authorities could spare, nine experts, being the whole class of seniors pursuing the study of forestry in connection with Yale. On this offer being accepted, the

nine set to work. They are making a working plan comprising, 1st, a topographical map of the whole wooded area; 2nd, a forest map, and 3rd, the working plan proper. In the meantime they are pursuing original investigations which will be beneficial not only to the particular estate with which we are dealing, but to all persons having interest in woodland. One of these lines of investigations is connected with the tolerance and distribution of the different species of trees including the preferences which the different species exhibit as to situation and soil, an investigation which concerns the very basic principles of modern forestry.

It is not only in old and highly civilized countries, like Germany and France, and in newer countries, like Russia and the United States, that Canada can find shining examples to stimulate her to a vigorous policy in respect to her forests; even countries like Japan, where the native mind works out its own problems unaided by the white man, show an intelligent appreciation of the importance of preserving the forests. In Japan the forests are about equally divided between the State and private owners. The former manages its woodlands through a forest service, and has provided every appliance deemed needful for the most up-to-date management by the most progressive nations of the world.

Everything points to the necessity existing that Canada should follow in the footsteps of India, France, Germany, Japan and the United States in this matter of forestry. At present our exports of forest products amount to \$5.60 a head of the population, being one of the largest, if not the largest, per head in wood exports of the world's wood countries. The signs of the times are that the demands upon Canada's resources will be greater in the near future.

Look at the development of the wood pulp industry in Canada.

I was requested by the Federal Minister of Agriculture to prepare a pamphlet on the pulp woods of Canada for the International Exhibition at Paris.

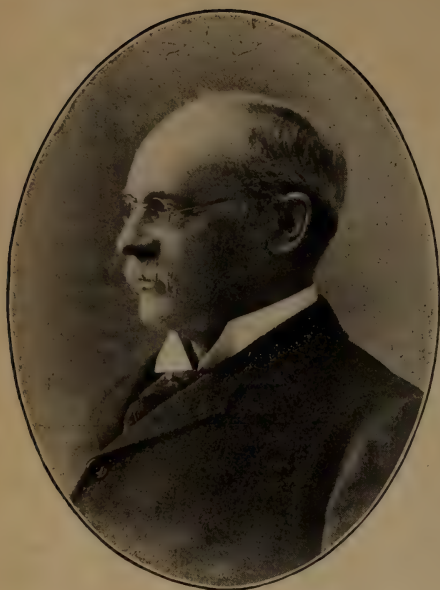
Two editions were prepared for that Exhibition, one in French and one in English, 10,000 copies of each. These went off "like hot cakes." The demand became great and for a year we were kept busy supplying from Ottawa persons in every part of the world, India, China, and Japan wanted to know about our spruce trees. The keen investigators of the United States wanted the pamphlet by the hundreds. The chief paper in the trade in London (England), published the pamphlet in full, together with many of the half-tone reproductions of photographs of the waterfalls of Canada. The chief paper, "Charta," of Italy, reproduced many of the half-tone illustrations. So also did "Paper," of New York, and several other of the class journals of different countries. Another edition of the pamphlet was provided for the Glasgow Exhibition. A fourth was distributed through the medium of the Pan-American Exhibition and a fifth and sixth editions were provided for the Wolverhampton and Cork Exhibitions. Why this unprecedented demand for a Government production? I cite the fact simply to show the degree and extent to which the world is turning to Canada for the material needed to supply the world's demand for cheap paper for newspaper purposes, in order to accentuate the necessity for active and energetic exertions scientifically conducted in behalf of our great forest estate, which ought to supply present day wants and should be so managed that future generations will thank and not curse the present generation.

In our forest wealth we have, more than in any other of our natural resources, a force whose potency for good cannot be over-estimated. We have in the past experienced the unkindliness of Brother Jonathan, whose tariff arrangements Canadians have had reason to think are as they are because of a desire, latent or expressed, to use trade as a lever to pry Canada into the Union of Republics called the United States. Being free men, Canadians have set themselves firmly against any measures employing

force. We have waited, and time is bringing its revenge. This is the way they are talking now in the United States: "Our supply of wood pulp is being rapidly exhausted, and we turn to Canada for our supply. Her explored forests contain supplies for years and years to come; her unexplored forests, an amount almost incalculable. If she should place an export duty on the raw material, why the whole newspaper trade of the country will be affected." As the newspapers govern the United States, we have the instrument in our spruce resources to enable us to govern the governors.

On the other hand with our forest resources, we can come to the aid of the Mother Land and thus contribute more than we have ever done to the practical unity of the Empire. The United Kingdom imported in 1900 over 160 million dollars worth of forest products, and of that amount over 138 million came from the seven great wood-exporting countries, probably more, as part of the export given to Germany in the British returns undoubtedly belongs to Austria-Hungary. Thus at least 85 per cent. of all her wood imports comes from the seven wood-exporting countries.

As some of these drop out, Canada and India can fill their places and thus in time aid the heart of the Empire to become more independent of outside help in this highly important line. The forest resources of India and Canada are to-day the most valuable assets of the Empire not only because of their present value, but also because of their potentiality in the future. Hence the necessity of the adoption of a wise and far-reaching forestry policy that will enable Canada to do what France has done, viz., actually increase her forest area so that in the years to come Canada will be increasingly able to supply the demands of the Empire in the wood line. If we seek a bright example of what can be done by the application of intelligence and skill to the problems of forestry, we can find it in the course pursued by the authorities of British India.



George Johnson

George Johnson, whose article on The Forest Assets of Canada, will afford a wide range of information for readers of this magazine, who are interested in the conservation of our pulp woods, is chief statistician for the Dominion Government, and the bureau of information, which is practically his own creation, is one of the most efficient of any country in the world.



THE PULP MILLS AT THE SAULT.*

BY E. G. M. CAPE, C.E., MONTREAL.

Canada, as a pulp-producing country, is becoming daily more important. It will continue to do so more in the future than in the past, as the forests of Sweden and the United States become depleted. Our neighbors to the south of us have in many instances exhausted their supply of raw material, and are looking to us to supply the deficiency. Along the Canadian shores of the Great

Lakes camps have been established for the purpose of cutting and shipping spruce to the American mills. The great paper mills at Niagara Falls, for instance, cut their supply of spruce on the north shores of Lake Superior and Lake Huron. Canadians are beginning to appreciate the advantages which this country offers for the manufacture of pulp, and, as a result, many mills have been built during the past few years. At Chatham, N.B., Grand Mere, Shawinigan, Sturgeon Falls, Sault Ste. Marie, and at many other points, new mills have been established.

At Sault Ste. Marie the ground wood mill has a daily capacity of about 100 tons. A sulphite mill, designed for a daily output of 60 tons, was finished a year ago. A paper mill to use their products is a natural sequence, and, on a recent visit to the "Soo," the writer was informed that plans had been prepared for one to be built on the American side of the river. The pulp from the Canadian mills can be taken across to the paper mill in tank barges at very small expense. The "Soo" as a centre for pulp-industry possesses many advantages, the chief of which are: That the necessary raw material is found in the neighborhood, and that power can be developed at a very low cost. The country from the Great Lakes to Hudson's Bay contains vast areas of spruce forests, from which the wood is cut. The rapids of St. Mary's river furnish the power.

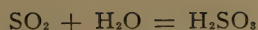
In the manufacture of paper, a mixture of ground pulp and chemical pulp is used. The ground pulp forms the body of the paper, and the chemical pulp gives it the necessary fibre. The percentage of the two kinds of pulp used varies with the kind of paper to be made. For rough newspaper, 15 to 25 per cent. sulphite is used, while for Manilla paper from 50 to 100 per cent. is used. As sulphite costs about twice as much as ground wood pulp, the object of the manufacturer is to keep the percentage of the former as low as possible. Ground wood pulp is made simply by grinding barked spruce logs with great

* From a paper read before the Canadian Society of Civil Engineers. (See Folding Plate.)

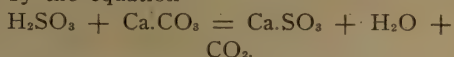
circular stones, on which they are pressed by hydraulic jacks. After a small amount of screening, the pulp is ready for the wet machines. In the manufacture of sulphite pulp the cost of the chemicals used is considerable. The sulphite pulp itself is made by cooking spruce chips in calcium sulphite liquor $\text{Ca.SO}_3 + \text{H}_2\text{O}$. This liquor is made usually by burning sulphur and passing the gas formed through lime water. The sulphur used in most American mills is imported from Sicily at a cost of \$25 to \$30 per ton.

In the sulphite mill at Sault Ste. Marie the sulphur dioxide (SO_2) gas used in the manufacture of the calcium sulphite liquor, is obtained as a by-product from the pyrrhotite reduction works, and thus a considerable saving is effected. At most roasting plants this gas is allowed to pass away into the atmosphere. At one point, where the train passes near Sudbury, the vegetation of a whole hillside is burned and withered as a result of the sulphur fumes from a smelter. The same thing can be seen at Trail, B.C. At the "Soo," as has been mentioned above, this gas is drawn off from the roasters, and is passed through a dust separator and cleaning towers, where it is purified and washed. When the gas, which contains 5 to 9 per cent. sulphur dioxide mixed with air, has been thoroughly cleaned, it is blown over through a lead pipe to the acid plant at the sulphite mill.

In this plant are eight wooden towers, each 5 feet inside diameter, 95 feet high. They are filled with broken limestone, supported at several points by wooden grates. At the top of each tower is a water pipe and sprayer, arranged to distribute the water over the limestone; at the bottom is a gas connection leading to the pipe from the reduction works. To make the calcium sulphite liquor, the gas is turned on at the bottom of a tower, and is forced up through the broken limestone; at the same time water is turned on at the top of the tower, and flows down through the limestone. Two reactions take place—first, the sulphur dioxide combines with the water to form sulphurous acid,



This acid then reacts upon the carbonate, which is present in the form of limestone. The reaction is represented by the equation



The strength of the sulphite liquid or acid flowing out at the bottom of the tower, depends on the percentage of the sulphur dioxide in the gas and on the quantity of gas used. In order that the proper action may take place in the digesters, the percentage of sulphur dioxide in the liquor must be at least 4 per cent. If the gas from the reduction works contains less than 8 per cent. of sulphur dioxide, the acid drawn off from the bottom of a tower is found to be under the required strength. In this event, it is pumped up to the top of a second tower similar to the first, where it takes the place of the water supply. Its strength is here increased until it contains the necessary percentage of sulphur dioxide, i.e., 4 per cent. It is then pumped to storage tanks, where it is kept until needed. There are four of these tanks holding 30,000 gallons each.

In the preparation of the wood, the spruce logs are first sawn into two-foot lengths, and these pieces are taken by means of a water conveyor to the barkers. There are eight of these machines, with 5-foot cast iron discs. Each disc has three knives attached to it, by which the logs are barked. The logs are then carried by a chain conveyor to the chipping machine, where they are cut into chips three-quarters of an inch long. These chips are crushed and screened, and are ready to be taken over to the sulphite mill. So far the wood has been treated in what might be called a chip-preparing plant or wood room. This is situated at a distance of 260 feet from the mill. The chips are transferred from one building to the other by means of a 16-inch spiral screw conveyor. On reaching the mill they are carried by an elevator to the top of the building, and dumped into a bin holding 28,000 cubic feet. This bin is fitted with sliding gates above the digester mouths. By opening

one of these gates a digester can be filled in about twenty minutes.

The actual chemical treatment by which the wood is turned into pulp is as follows: 6,460 cubic feet of chips are first put into a digester, filling it to within 10 feet of the top; then 30,000 gallons of 4 per cent. acid is pumped in, filling the digester to within about 13 feet of the top. The cover is screwed down and dry steam, at 80 lbs. pressure, is admitted at the bottom of the digester through a 5-inch pipe. The pressure in the digester (and consequently the temperature), is gradually raised, until at the end of four or five hours it has risen to 75 lbs. per square inch. At the end of this time, to prevent the digester being filled with water of condensation, a valve on the top of the digester is opened and a mixture of sulphur dioxide with partially condensed steam, is taken off and passed through a separator, which passes the condensed water to the sewer. The gas is drawn off, cooled, and then returned to the storage tanks, where it is used to strengthen the liquor. Steam is kept on the digester until the pressure rises to 90 lbs. and the temperature to 300 deg. F. This temperature is maintained until the pulp is thoroughly cooked, the time required being from ten to twelve hours. Towards the end of this time tests are made at short intervals to ascertain the exact condition of the pulp. When it is cooked so that the liquor in the digester contains not more than one-quarter per cent. of sulphur dioxide, the steam is shut off, and the pulp is blown out of the bottom of the digester through a 12-inch pipe into the blow pits. About 17 tons of pulp are made in each cook, so that in the two digesters about 60 tons can be produced daily.

In the blow pits the pulp is thoroughly washed and all liquor drained off. From these pits it is pumped up to an agitator, broken up and diluted with water. The pulp then follows through a set of six coarse screens, which take out all the larger chips, over a riffler where all sand, etc., are settled out, and through a set of sixteen fine screens, which re-

move all remaining impurities. The pulp then passes to storage tanks, from which it is pumped, as required, into the wet machines, which roll it out and carry it to the dryers, where the percentage of moisture is reduced to from 15 to 20 per cent. The pulp, 80 to 85 per cent. dry, is then ready for shipment in the form of a sheet rolled up.

The mill where the above process is employed consists of three buildings—the sulphite mill proper, the chip-preparing plant, and the boiler house. The chip-preparing plant is a building 200 feet long by 50 feet wide, situated at a distance of 260 feet from the sulphite mill. Here 150 cords of wood can be prepared daily. One saw, eight barkers, one chipper, one crusher and screen are so connected by conveyors that this amount of wood can be passed in in the form of 16-foot logs, and come out in the form of $\frac{3}{4}$ inch chips. A 200-h.p. motor furnishes the power required.

The saw-dust, bark and screenings are carried by a float conveyor to the boiler house, and there burnt on special grates, furnishing some 300-h.p. To eliminate the danger of sparks from the chimney, an ingenious device is used. A fan draws off the gases of combustion, and passes them through a vertical pipe, whose bottom end dips 2 inches into a tank of water. Thus a water seal is formed which catches and extinguishes all sparks. The tank is connected to the stack, and the smoke passes off in the usual manner. In the boiler house are five Stirling water tube boilers, each of 250-h.p. capacity, and a Green's economizer, which is used for heating the feed water.

The acid plant, which forms a wing of the sulphite mill, has already been described, so we shall now pass on to the sulphite mill proper. This is a red sandstone building, 170 feet long by 70 feet wide by 120 feet high in front. The front portion is occupied by two digesters. These are great vessels, 17 feet diameter by 54 feet high, made of steel boiler plate $1\frac{1}{4}$ inch thick. The cubical contents of each digester is 7,000 cubic feet; the weight when filled is 450

tons. To carry this enormous load the foundations were carefully made, and were taken down to the solid rock. Each digester is carried by eight cast iron columns, 12-inch diameter, 12-inch thick, set on a circular masonry foundation. The steel work of the building does not help in any way to support the digesters; they are carried entirely from below. To protect the steel shell of the digesters from corrosion by the acid, a special lining is used. It consists of three layers of brick, each layer being 2-in. thick. Several kinds of brick were tried for this purpose. The one which gave the best satisfaction was a brick made of crushed granite. One digester was lined throughout with these bricks, and it has been in operation now for over a year without any repairs. In the lining of the other digester two kinds of brick were used—one a hard, vitrified brick, and the other a variety of fire brick. After these had been in use a short time, it was found necessary to replace them by those made of crushed granite. The cement used in lining the digesters was made by mixing one part of Portland cement with two parts of finely crushed granite; a solution of silicate of soda was used instead of water. The cement set very quickly, five minutes giving an almost perfect set. It was mixed in very small amounts and applied instantly. The bond between the bricks and the shell and between the bricks themselves was excellent. It was found in many tests that the bricks themselves would break rather than separate from the cement. Since that time this cement has been used by the writer in several cases where quick setting and great strength and hardness were necessary. For instance, in repairing leaks in the bottoms of gas holders, where there was a pressure of water from without, the flow was stopped by using bricks set in this cement. It costs about 50 per cent. more than cement prepared in the ordinary way.

Behind each digester, and connected to it by a 12-inch pipe, is a blow pipe 45 feet by 28 feet by 16 feet deep. The walls of each pit are of masonry 4 feet

thick, lined with timber to withstand the great force of the pulp as it is blown from the digesters under 80 lbs. steam pressure. The bottom is lined with 2-in. planks, set on a solid foundation of concrete. These planks have perforations 3-16-inch in diameter in them, through which the liquor that is left in the pulp is drained off. From the top of each blow pit a timber pipe 10 feet by 12 feet carries off the gases to the atmosphere.

In the screening rooms are six coarse screens and 16 fine screens. These 16 fine screens have been found capable of passing only 25 to 30 tons a day. Two centrifugal screens of a capacity of 15 tons each are now being added. There are four wet machines, each connected to a drying machine. These are made at the "Soo" by the Algoma Iron Works. In fact, most of the machinery in this mill, with the exception of the digesters and motors, was made by the company.

There are four wet machines, having a capacity of 15 tons each per 24 hours. Each wet machine is made up of a tank 6-ft. long, in which revolves a hollow cylinder covered with fine wire gauze. An endless blanket passes over this cylinder and over a set of wooden rollers. The tank is kept filled with pulp of about the same consistency as cream. Most of the water with which the pulp is mixed forces its way through the blanket and through the gauze cylinder, and is drained off, leaving the pulp adhering to the blanket in a thin layer. The blanket carries it between a pair of wooden rolls, where about 50 per cent. of the moisture is squeezed out and the pulp layer made strong enough to carry itself. It is then separated from the blanket and passed to the drying machine, where it is dried by passing in succession over three cast iron steam-heated cylinders. The dry pulp is taken off in rolls of 250 lbs. ready for shipment.

At the present time the mill is turning out from 20 to 25 tons of finished product. This output will doubtless be largely increased in the near future. The screens have not been able to properly

handle more than this amount, and some trouble has been experienced in manufacturing the acid from the by-product gas given off at the pyrrhotite reduction works. In the ordinary process of making sulphur dioxide by burning sulphur it is comparatively easy to get a gas running 10 per cent. sulphur dioxide. In the reduction works at the "Soo," it is very difficult to approach this figure, as the pyrrhotite must be dead roasted. In order that it can be used in making nickel steel, the product of the roasters must contain less than 1 per cent. of sulphur. To bring the percentage as low as this a heavy air blast must be used in the roasters, and hence the gases given off contain a large percentage of air. So far, they have succeeded in producing gas running about 5 to 6 per cent. sulphur dioxide. By changing the arrangement of the acid towers, i.e., putting two towers in series and increasing the velocity of the flow of gas through the towers, it has been found possible to make an acid of the necessary strength, i.e., one containing 4 per cent. sulphur dioxide. The screening capacity of the mill is being increased by installing two centrifugal screens of a daily capacity of 15 tons each. There is every reason to hope that the mill will soon be turning out about 50 tons of sulphite pulp daily. At present the mill is turning out unbleached pulp. Arrangements have been made with the Canadian Electro-Chemical Company to supply the bleach liquor, and bleach tanks have been erected in the basement of the sulphite mill.

Before finishing with the sulphite pulp industry, as it exists at Sault Ste. Marie, it will be interesting to examine some figures on the cost of production. To make one ton of pulp the raw material required is 2.2 cords of wood, 500 lbs. of sulphur dioxide gas, and 450 lbs. of limestone. Delivered at the mill, these materials cost as follows: Wood, \$5 per cord; gas, \$15 per ton; limestone, \$1.75 per ton—that is, the raw material used in making one ton of pulp costs about \$15. The cost of coal, labor and power is about \$10 per ton of pulp produced,

so that the total cost per ton is very nearly \$25. As the present market price is \$30 per ton, f.o.b. cars, Sault Ste. Marie, the profit per ton is in the neighborhood of \$5. If the ultimate capacity of the mill be 50 tons per day, or 15,000 tons per year, the annual income would be about \$75,000, which, after paying for repairs, insurance, depreciation, etc., should leave enough to pay a fair dividend on the capital invested. It is only fair to remember that the existence of the sulphite mill adds largely to the profits from the reduction works. If it were not for the sulphite mill, the gas from the roasters would be thrown away. As 12½ tons of gas (at \$15 per ton) are required to produce 50 tons of sulphite pulp per day, we can see that the sulphite mill should add in the neighborhood of \$185 per day to the profits of the reduction works.



QUEBEC PULPWOOD ASSOCIATION.

The annual meeting of the Province of Québec Pulpwood Association was held at Sherbrooke on the 16th April, H. M. Price, president, in the chair.

The secretary reported on the work of the association since its formation in April, 1902, and his statement showed the finances to be satisfactory. One business difficulty of members during the year was the shortage in supply of railway cars, but this is improving. The price of pulpwood has tended somewhat lower during the past year, and production is being reduced about a third this year.

The delegates of the association, who on the 7th November last, had an interview with the Hon. S. N. Parent, the Premier and Commissioner of Crown Lands of Quebec, to ask him to re-establish the old price on stumpage on pulpwood presented their report.

The resolution that was presented to the Government, and which embodied the views of the association, as regards the stumpage dues, read as follows:

"That a delegation, composed of all the directors of the association, wait upon the Commissioner of Crown Lands,

the Honorable S. N. Parent, at Quebec, on Friday, the 7th November, 1902, at 4.30 p.m., with a view of having the stumpage dues on pulpwood replaced at \$1.90 per cord on pulpwood manufactured into pulp in Canada and to take up any other question relating to the regulation of sale and manufacture of pulpwood in the province."

Hon. Mr. Parent objected to replacing the stumpage dues on pulpwood at \$1.90 per cord, stating that it was against the interests of the province for the following reasons:

1. While the \$1.90 duty was in force cutting of pulpwood on Crown lands was reduced.

2. Such duty was against settlers' interests, as they were bound to pay a duty of \$1.90, when selling pulpwood for exportation, whilst the owners of seignior and patented lots were not affected by said duty and could sell their pulpwood at a great profit when the settlers could not.

3. The reducing of cut on Crown lands were against labor interests, as there were less men employed in the winter shanties for cutting and carting and in the spring for floating pulpwood.

4. It was against the interests of the province in the sale of limits by keeping off competition from foreigners.

5. Because the \$1.90 duty would not force Americans to establish manufactures in this province, as they could get all they wanted in pulpwood outside the province, viz., from New Brunswick, from Nova Scotia, and even Ontario.

6. That the stumpage dues on pulpwood for exportation are 65 cents per cord of 128 cubic feet, which was equivalent to \$1.08 per 1,000 feet B.M., that is at a higher price than for our merchantable spruce, which is 65 cents per 1,000 feet B.M.

7. That the ten years term was in existence since 1883 for all timber, when it was enacted at the request of banking and lumber interests to ensure the stability of the trade, and that in 1898 the policy was not yet fixed on that question.

[The members of the Pulpwood Asso-

ciation regretted that they could not view the matter from Mr. Parent's standpoint, contending:

1. That it was a good thing that the cutting of pulpwood on Crown lands was reduced, unless the pulpwood was manufactured into pulp in the province.

2. That, as a large proportion of the settlers had letters patent and were consequently on a par with the owners of private lands, they would be materially benefited by forcing the mills to establish themselves in this province, and that a desirable arrangement could be made with those who had not yet obtained their letters patent, so that no hardship should be inflicted on the settler.

3. That the cost of stumpage on private lands was very much in excess of that charged by the Government, viz., 65 cents per cord, as stumpage on private lands is worth at least \$1.50 per cord.

4. That the interests of labor were that pulp and paper mills should be established on this side of the line.

5. That the Americans would come into this province and buy the limits with a view of putting up pulp and paper mills here instead of exporting the wood unmanufactured.

6. That the province of Quebec was one of the main sources of supply for the American market of pulpwood, and they could not afford to do without it.

The members of the association desired also that, if it was impossible to replace the duty of \$1.90 for pulpwood cut on limits now under license, it should affect all future sales of limits until 1910, when the present arrangement would terminate.

H. M. Price, of Quebec, was re-elected president, and E. W. Tobin, M.P., of Brompton Falls, vice-president, and E. C. Gation, Sherbrooke, secretary-treasurer. The other directors for the ensuing year are: F. N. McCrea, Sherbrooke; O. C. Morissette, Lake Megantic; G. H. St. Pierre, Coaticook; O. Brouillard, Carmel Hill; G. C. Poulin, St. Johns; G. T. Smith, Quebec; B. C. Howard, Sherbrooke; G. P. Nadeau, Stanfold, and John Champoux, Disraeli.

The next meeting of the association will be held towards the end of May next.



ANGLO-CANADIAN PULP TRADE.

Wm. P. Ryrie, of the Ryrie Paper Co., Toronto, and agent in Canada for Becker & Co., pulp merchants of London, has returned from a business trip to the Old Country. Mr. Ryrie has favored the Pulp and Paper Magazine with a few observations on trade matters which will interest Canadian readers. Mr. Ryrie said to our representative.

"About ten years ago, I took the opportunity of visiting Norway, with a view to investigating the nature and extent of the wood pulp industry, which was, even at that time, assuming large proportions, and it occurred to me that there should be no insurmountable obstacles in the way of development of a similar character, as far as Canada was concerned. I well remember expressing the opinion that within ten years, we in this country ought surely to wield an influence in pulpdom, and it is most gratifying to me, and, I am sure, to all Canadians, to learn that within a decade, which in the life of a nation is but a moment, we now play such an important part in the supplying of material to the British paper makers.

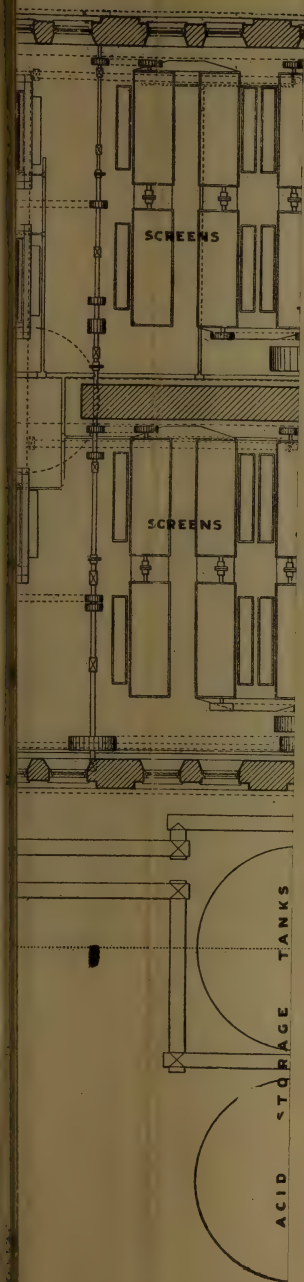
In the early history of the trade, it would appear as though the buyers in the Motherland were actuated by the feeling that on the ground of sentiment a preference should be given to Canada, as against foreign countries, but whether this were so or not, the fact remains that our product finds great favor with the trade there, and it may surprise many to learn that whereas until five short years ago, we furnished approximately 5 per cent. of the total British requirements of mechanical or ground wood pulp, in the present year, I can state from my own personal knowledge of events, we will figure to the extent of at least 25 per cent. of the total imports in this particular line; a noble record, and one which has not been achieved without a

vast amount of hard work and a careful study of existing conditions in the Old Country.

I feel that more than a passing word of praise and commendation should be given to S. Charles Phillips, publisher of the "Paper Maker" and other British trade journals, for the prominence he has given to Canada as the future field for the supply of wood pulp for the British market, he having for many years persistently and consistently advocated closer relations between the Canadian pulp makers and the buyers in his own country.

Even five years ago, the idea of our being any considerable factor in the situation was not seriously entertained by many of the best informed people in Europe, and within a shorter period, our country was visited by a Scandinavian commission, whose official report stated, in effect, that nothing need be feared from Canadian competition, though these same people must now feel that their conclusions have not been fully borne out by the facts.

It must not be inferred, however, that we have got the Scandinavians beaten in the race, as there are still many points upon which we should improve, if we hope for precedence, and chief among these is the question of moisture. As a general proposition, it must be understood that the paper makers will not accept of the mechanical pulp in the dry state, so that we are forced to adapt ourselves to the prevailing requirements. Most of the Canadian pulp makers aim at shipping their product at 50 per cent. dry contents, and, in one instance, at least, I know of continuous shipments for weeks together at about an average of 55 per cent., dry, but the difficulty is that parcels sometimes go forward at 52 per cent. dry, and, at other times, as high as 57 per cent. dry, and it is to this irregularity that the paper maker so strongly objects. He says that the aim should be to have absolute uniformity, even if it should be only 50 per cent. dry, and his request is certainly most reasonable, inasmuch as in "furnishing" his stock, a variation of 3 or 5 per cent. in



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the dry contents has a perceptible effect on his finished paper.

A further point worthy of consideration is that in order to do away with another source of heart-burnings, it would be advisable to throw in a small surplus of pulp in each bale (say 1 per cent. or more), which, though it does cost a trifle at the point of manufacture, will do away with all claims for shortage in weight which may arise from waste in transit. This course is pursued by a large number of the Scanainavian mills, and when done in conjunction with a uniformity of dry contents, it abolishes the continuance of annoying claims.

Just a word about the estimate in which our Canadian pulp is held by the Britishers. I discussed the situation with most of the large users, and found that while the consensus of opinion was distinctly favorable, largely owing to the length and strength of fibre, there were some who complained that the sheet of paper produced from our pulp was not as firm and well formed as is made from the Scandinavian pulp, being of a more "fluffy" character. However, if this should become a positive objection, it can be remedied in the process of grinding and preparing the pulp. One maker stated to me that he got excellent results by carefully blending Canadian and Scandinavian ground wood and sulphite, but, in my opinion, there is no reason why we should not cut out even the percentage of foreign stock now used."



IS THE PAPER AND PULP INDUSTRY OVER-DEVELOPED.

Replying to a recent enquiry from the Pulp and Paper Magazine as to the report that the International Paper Co., of New York would erect pulp and paper mills in the vicinity of Three Rivers, Hugh J. Chisholm, president of that corporation, wrote that while his company were not prepared to intimate what its plans were at the present time, he would observe that he regarded the paper and pulp industry as being generally over-developed.

On being asked whether his remarks applied to the United States or Canada, Mr. Chisholm replied in the letter following. As Mr. Chisholm is a Canadian by birth, and is now the head of a corporation owning twenty-nine mills in the States, his knowledge of the industry must be exceptionally extensive and his opinion therefore will be seriously weighed by those interested in the business in this country. In this connection the reader will note an extract, in another part of this issue, from a letter on the Scandinavian pulp trade in which that of Canada comes most in competition upon the British market:

"Dear Sir: Your letter of the 29th ult. came duly to hand and in answer to your enquiry as to whether I referred to the paper industry in the United States or Canada as being over-developed, I would say that I had in mind more especially Canada, which was under discussion, but it is also true of the United States.

There is not only the Scandinavian competition in pulp and paper, which is very formidable, but England itself, on which country we are relying for an export market to such an extent, is by no means out of the race in the matter of production. Her paper manufacturers can get wood at very low figures in Norway and can convert it there into pulp, very near the seaboard, where they have excellent water powers and most competent mechanical engineers; they can then take it by ship at an extremely low rate of freight directly to some of their mills on the navigable rivers of England and thus avoid all inland freight rates. This gives England her pulp at figures which compare very favorably with the lowest cost of production in Canada or the United States.

It must also be remembered that many of the English mills are equipped with American machines or those built on American models and I have seen it stated that the fastest machine in the world is to-day running in England. The great bulk of paper used in England to-day is made there and only gradually can Canada or this country expect to extend its trade there. The United States to-day

is making more paper than it requires and Canada is likewise. Therefore, the development of the industry must be very gradual or it will bring disaster to the vast capital already invested in it. Efforts of promoters to induce capital to locate mills in Canada regardless of the demands for the product or the competition existing and in ignorance of other controlling conditions of the industry, cannot but unfavorably affect Canada's industrial prospects.

Yours truly,

HUGH J. CHISHOLM,



SCANDINAVIAN PULP TRADE.

The Christiania correspondent of the Paper Trade Review of London, writes:

"The amount of business done during the last few months has been very small. Those buyers who have not contracted with speculators at low prices keep back from buying, evidently believing that sellers will be obliged to come down in prices a little later on. Meanwhile the stocks of importers are gradually dwindling down to quantities of very little importance, and it may become a question which of the two parties, buyers or sellers, will have to give in first.

"Over here the talk about restricting the production of pulp is up again. The restriction of output brought into force by the sawmill owners of Norway, Sweden and Finland, and carried through to the ultimate benefit of exporters, is given as an example as to the practicability of the scheme, and it must be admitted that, just as well as sawmills, the pulp mills ought to be able to carry through such a restriction. The pulp exporters, both here and in Sweden, are better organized than the timber exporters in the two countries, and Scandinavian pulp is more of a necessity to the paper makers abroad than timber. The one thing which may be disastrous to the scheme is that perhaps many of the mills may have no slender means that this will prevent any stoppage of work. This, however, still remains to be seen.

'The Norwegian Pulp Manufacturers'

Association is about to call a meeting of its members. Perhaps some decision about future action will be arrived at. The prices offered from abroad are still about Kr. 30 f. o. b. and contracts with French buyers are rumored even at the price of Kr. 28.50 f. o. b. It is needless to say that these sales have no foundation in purchases on this side.

"On account of the mild weather prevalent the water scarcity is less than before. The mills in the Drammen district are some of them working with increased production, and in the Skien district the greater part of the mills have started working, increasing their production from 40 to 50 per cent. of the normal. So far advanced into spring, and with the recent large snowfall over the greater part of southern Norway, the masses of snow in the highlands will soon melt and take with themselves everything down to the bare ground. It is therefore to be expected that the factories will have water for normal production, all of them, with in end of April.

"The dividends declared by the paper and pulp mills for the last year show very unequal results of the year's trading. The Drammenselvens Papirfabriker declare 8 per cent. dividend, while the Purkerud Paper Company can gladden its shareholders with 12½ per cent. on the capital. A dividend of another kind is declared by the bankruptcy estate of the late firm, Chr. Christophersen. The unsecured creditors of this estate will, during the summer, obtain 7 per cent., which is, however, not final."



CANADA PAPER CO.'S NEW MILL.

The new St. Francis mill, just on the point of being started up by the Canada Paper Company, at Windsor Mills, Que., is said to be the finest mill in Canada. Both the lay-out and construction of the mill were under the direction of George F. Hardy, C.E., of New York, the whole work being carefully supervised by General-Manager Campbell.

The grinder room, which is directly

over the flumes, is 50 ft. by 158 ft. and will contain ten 3-pocket grinders built by the Jenckes Company, of Sherbrooke. The flumes contain fifteen 62-in. wheels and one 68-in. yielding over 5,000-h.p. The beater building is one magnificent room 100 ft. by 136 ft., built entirely of steel and concrete. This room, beside the beaters, will also contain the screens and separators, while the basement, which is high and well lighted, contains storage tanks and pumps. The machine room is 49 ft. by 262 ft., also of steel and concrete construction with brick walls. It is equipped with a 156-in. Pusey & Jones' high-speed Fourdrinier which, while not quite the widest, is probably the heaviest machine yet turned

running largely on wrappings, and the latter on book and specialties.

F. J. Campbell, the general manager of the Canada Paper Co., stated that with the exception of the paper machine, practically all of the machinery has been built in Canada, the orders going largely to the Wm. Hamilton Co., the Jenckes Machine Co., Waterous Engine Works and the Dodge Mfg. Co. Mr. Campbell hopes to have the mill running in August.



EXPORT DUTY OR PROHIBITION.

A correspondent from Nova Scotia writes: "I trust the Pulp and Paper Magazine will meet with success, and



Canada Paper Co.'s New "St. Francis" Mill.

out by that firm. From the machine room one enters the finishing room, which is 40 ft. wide and 196 ft. long. Every part of the building, with the exception of the grinder room, has a high and well lighted basement. The machine and grinder rooms are equipped with large travelling cranes, while the finishing room and beater room are fitted with Otis-elevators.

Newspaper will be made exclusively in this mill, the other departments of the company's business being taken care of in the Springvale mill, which contains two machines, and the Windsor mill with two more machines, the former

let me suggest that you start out on the round-wood question, and never let up until the Government has prohibited the export of pulpwood from private and Crown lands alike. If some of the interests affected by such a course are entitled to consideration, the ultimate results are sure to justify the use of a portion of the much-talked-of surplus now of yearly occurrence, and the growth of the pulp and paper business in Canada, during the last few years, is the warrant for the Government's taking as much interest in the future of the industry as has been taken in regard to iron and steel. Very little argument is required

to back up the statement that capital will not seek a country which allows another nation to use up the spruce timber, which in a few years will treble in value, and if husbanded eventually be the base of the world's paper requirements. In view of the reading of the present American tariff, an export duty on wood is foolishness, but prohibition of the export will not result in any addition to the duty on pulp going to the United States."

Mill Matters

The new pulp mill of the St. George (N.B.) Pulp & Paper Co., are to be in operation this month.

It was stated that the Hull & Ottawa Power Co., who proposed some time ago to build a pulp mill at the Chaudiere, will go ahead with the work this summer; but we learn from the company that they have no such present intention.

Andrew Cushing & Co., of St. John, N.B., have been successful in making wood board from the saw dust and small refuse from their mills, and the process has been adopted in the States, by the Rockland Paper Mill at Palmer-town, Conn.

J. C. Wilson & Co., of Montreal, have ordered a 84 in. set of chilled super-calendar rolls for their paper mills at Lachute. This company, which does a large manufacturing business in paper bags and envelopes, has opened a branch warehouse at 56 Albert St., Winnipeg. This branch will be in charge of J. E. Holland, who has been twenty years in the company's employ in Montreal.

The Montrose Paper Co.'s new mill at Thorold is nearly completed, and the company expect to commence making bond, ledger and letter paper about the first of June. The mill is of brick and has a floor space of about 37,000 square feet. Power is to be obtained from the Welland Canal. This is a new company capitalized at \$125,000, with W. G. Fin-

lay, of St. Catharines, president, and T. W. Brown, manager.

It is stated that the Clergue company, of Sau't Ste. Marie, has secured enough pulp orders from concerns in England to employ the works for three years. The company proposes to make a working exhibit of the process of pulp making at the Toronto exhibition this year.

The Canadian Finance Syndicate Ltd., a British concern with a capital of £15,000, has an option on timber areas in B. C. The property is on Princess Royal Island and includes water power of 4,000 h.p. on the Findlay river. The area is 83,200 acres, and having got the land the syndicate will try to form a company to build pulp mills of a capacity of 100 tons a day, exporting the product chiefly to Australia and Japan.

To carry on the bleaching process in pulp making, it is necessary to draw off the water evenly and quickly. The Klary and Snell drainer stones were invented to fill these requirements and so, well have they answered the purpose, that they have been introduced into the best pulp and paper mills in Canada, the United States and Great Britain. The material of these stones is very durable, and they resist the action of acids and bleaching agents. This type of drainer stone is patented, and is manufactured solely by Samuel Snell, Holyoke, Mass.

The Compagnie de Pulpe de Jonquiere, of Jonquiere, Que., report that their pulp mills are running full time, and the machinery for the new card board mills is arriving as fast as it can be got in. By July 1st, they expect to be making 20 tons of special double lined, and single lined card board, plain pulp board, tag, wrapping and all kinds and colors of board. Their new machines are the first in Canada that can put the appearance of a highly calendered coated board onto a sheet of double lined card board, and by the time the two machines are in operation they hope to be placing their entire product, which will be 40 tons daily, in the Canadian market. R.

S. P. Smyth is general manager of these mills, and F. W. Dennison, superintendent.

The Thomson Paper Co., of Newburgh, Ont., are installing a new steam engine for driving their paper machine. The output of this mill has been increased and if the present demand is maintained, it will be necessary to install another paper machine this summer.

The Nova Scotia Wood Pulp and Paper Co., Limited, of Mill Village, Queen's Co., N.S. are just completing an up-to-date ground wood mill, replacing the one burned last June. The mill is equipped with four New England grinders, and the production of 40 tons per day is all to be pressed to 53-55 per cent. A dry, for export. The mill is admirably situated for trade with the United States or transatlantic markets, and shipments are made the year round from Port Medway, where vessels of 6,000 tons can load always afloat.

T. Pringle & Son, mill engineers, of Montreal, have just moved into their new offices in the Coristine Building, St. Nicholas street. The suite of rooms includes business offices, private consulting rooms, blue print rooms, and a very large drafting room having a northern light. The rooms are the largest and best equipped of any civil engineer's offices in Canada. The firm makes a specialty of pulp and paper mill engineering and water powers and electrical works. The pulp and paper branch is in charge of Alex. Pringle and H. G. Turner, the latter having been for some time with the Oxford Paper Co., of Rumford Falls, Me., and formerly with Tower & Wallace, paper mill engineers of New York.

The Tacoma Co., (Steel Corporation) of Tacoma, Wash., have interested themselves in a pulp and paper mill on Quatsino Sound, Vancouver Island. Concerning this important project they write: "We think we have sixteen hundred million of the finest pulp timber in the world, as well as a large amount of other timber, as much more cedar and yellow fir and trees large enough to cut clear spruce, and we have a splendid

harbor. We have just taken our limit and have two years to build this mill and select our lands. We intend to commence this summer selecting the lands and make the first strike in building a mill. Probably we will build a sawmill first. We shall build a pulp mill necessary to take in 100 sections of this timber land under the pulp act in British Columbia."

The mills of the Royal Paper Mills Company, at East Angus, Que., were partially destroyed by fire on the 2nd inst. The fire is said to have caught in the saw mill, which was completely destroyed. The fire extended to the pulp mill, which was only partially burned, some of the valuable machinery being saved. The loss to the pulp mill will likely exceed \$40,000. The buildings and contents carried an insurance of about \$65,000. These mills consist of a soda fibre mill of six digesters, having a capacity of 56,000 lbs. per day; and a ground wood mill in course of construction, having ten grinders and twelve wet machines, capable of turning out 50 tons a day. The paper mill has an 84 inch and a 96 inch fourdrinier machine, and makes book, cover, envelope and writing paper, with a total capacity of 15 tons a day.

The mills of the Price-Porritt Pulp and Paper Co. are situated on the Rimouski river, about two miles from tide water. Extensive pulpwood limits are located on the same river and its tributaries. The falls are 52 feet high and will give ample power for manufacturing. The company at present are putting up a ground-wood plant of six grinders directly coupled to wheels made by the S. Morgan Smith Co., of York, Pa.; 25 dry tons per day is the expected output. This plant will be in operation early in July. The mill will be connected to the dock by an aerial cable-way, and the output shipped to the British market. The company are building houses for the work-people, and if they have sufficient encouragement, no doubt a village will spring up around the works. Last August this property was a forest.

The Blanche River Pulp & Paper Co. is being wound up by order of court. R. W. Leonard, the applicant for the winding up order, states that the liabilities of the company are \$6,000, and assets \$3,000. The Blanche river empties into the head of Lake Temiscaming, and here the company had secured a concession, but under the Ontario Government regulations, such lands are subject to settlers' rights, and settlers having invaded this region a block of land was set apart for the South African veterans. As spruce timber is not reserved by Government, a settler naturally begins to cut his spruce and market it, if he can, as a first source of revenue from his farm. One of the conditions of the concession was that the company was to have expended \$300,000 by last October, which it did not do. Apparently little or nothing had been done towards the development of the proposed works.

It has been thought by many interested in the export of pulp wood, that the Maritime provinces would not adopt the policy of high stumpage dues advocated in the Upper provinces, as it was thought that the lumber men who constitute a considerable element in the voting power of the east would strongly oppose any increase. The New Brunswick Government, however, is not deterred by this fear. Premier Tweedie in his budget speech last month said there would be an increase in stumpage. The stumpage was reduced to \$1 a thousand in 1890 in consequence of a depressed state of the lumber industry. Conditions have changed. The lumber operators are prosperous and can afford to pay higher rate of stumpage. "We propose," continued the Premier, "to increase the stumpage, not to injure the lumberman, but to obtain more revenue for the country." The rate of the stumpage has not been announced, but will probably be fixed by order in council.

The last issue of the Canadian Engineer gives an account of the industries of Chicoutimi, by Chas. Bail-
laire, C.E., of Quebec, in which the

following reference is made to the works of the Chicoutimi Pulp Co.: "Emile Cote, of Quebec, is contractor for all the masonry, including dam, power house and pulp mills, while Berlinguet and Lemay have been intrusted with the architectural features of the installation. Mr. Winsler, a Norwegian engineer, is the designer of the pulp works machinery, and will be retained by the company as managing engineer of the power works and pulp mills. There are two mills: the first or smaller built some few years ago on the opposite side of the Chicoutimi river, and now worked by a separate flume from the fountain head, but which will hereafter be connected with the new and larger works, and worked by the tail water from the new structure, being as it is, at a level some 80 ft. lower than said structure. The output of both mills, it is expected, will not be less than 300 tons per diem. The works are under the general superintendence of Mr. Dubuc, one of the directors of the company, of which Gaspard Lemoine, of Quebec, Nemése Garneau, and others are members, and the works in the aggregate will not cost less than one million dollars.

In the Quebec courts this month, Sir L. N. Casault gave judgment in the case of the Cascapedia Pulp & Lumber Co., in liquidation. P. Garneau Fils & Co. who were creditors of the company to the amount of \$4,166 and only got \$106.59 by way of dividend, petitioned to have the names of J. M. Fortier, of Montreal, and Alphonse Charlebois, contractor, of Quebec, placed on the list of contributories each in the sum of \$25,000. The property of a former concern called the Maria Pulp and Lumber Co., had been transferred by Charlebois and Fortier, to the Cascapedia company, at what was alleged to be an extravagant price, but it was shown that even at this high price the shares owned by them would not have been paid for, and the creditors of the last formed company were wronged by the refusal of Charlebois and Fortier to pay up their shares. The substance of the judgment was

this: "That a creditor of a company in liquidation, which does not realize a sufficient amount to settle its debt, may ask that all the contributories who have not paid up all their shares be placed on the list of contributories for the full payment of such shares." Messrs. Fortier and Charlebois will therefore have to pay up.

That there is "something doing" in the Rubber Belt trade, the announcement of the Durham Rubber Co. on another page makes evident. The fact that the pushing Bowmanville people have repeatedly enlarged their plant during the past two years, and are now running day and night, is another instance of the healthy progressiveness of many of our Canadian industries.

A syndicate composed of New England and New Brunswick men have applied to the legislatures of Maine and of New Brunswick for power to dam the St. John river at the "winding ledges" at Fort Kent near the boundary, the dam to be run to the Canadian shore in the parish of St. Francis, and used for pulp, paper and lumber mills. The application in the New Brunswick legislature was referred to a special committee which reported strongly against it, as it would be prejudicial to the interests of the province, and would also contravene the Ashburton Treaty, which provides that the St. John river shall always be free to navigation. A petition against it is also presented to the Dominion parliament. The chief U. S. promoters of the scheme are: Hon. A. A. Burleigh, senator from Aroostook County, Me.; Hon. Charles A. Milliken, of Augusta, Me.; Hon. George A. Murchie, of Calais, Me.; Hon. Redfield Proctor, United States senator of Vermont; James W. Parker, of Portland, Me.; Abner W. Hayford, of Boston, Allen E. Hammond and Peter C. Keegan, of Van Buren. The Canadians are: Hon. John Costigan, of Ottawa; Hon. William Pugsley, of St. John, N. B.; James Robinson, of Millerton, N. B.; and Thomas J. Cochrane and John M. Stevens, of Edmundston, N. B. Attorney

General Pugsley has withdrawn from the project, which is not likely to go through.

It is estimated that 400,000 cords of pulp wood were shipped from Quebec to the States last year, and that about 700,000 will go out of that province this year.

The Canadian manufacturers of wall paper waited upon the Minister of Finance before the tariff policy was announced and asked more protection on account of U.S. manufacturers making this a dumping ground for job lots. The budget speech delivered last month disclosed the fact that this market will remain the Friday bargain counter for U.S. manufacturers.

James L. Newton, of Watertown, N. Y., recently closed a deal with the Quebec Government by which he became owner of two water powers on the Pentecost river, a tributary to the lower St. Lawrence, for \$13,500. One of these powers has a head of 54 feet high and the other 70 feet, and they are situated in a heavily timbered district. It was reported that pulp mills would be erected there this spring, but Mr. Newton informs the Pulp and Paper Magazine that nothing has been decided in this matter yet.

It is understood that the recent agreement made by Wood, Baker & Co., lumber dealers of Boston and New York, to purchase 1,146 square miles of timber limits in Newfoundland from the Exploits Lumber Co., of Halifax, N.S., will be completed next month. The company was well named, for the promoters—among whom were the late Hon. A. R. Dickie, and members of the firm of Rhodes, Curry & Co., of Amherst, N.S.—obtained the concession for a song, and after erecting saw mills and developing the property have sold it to the U.S. firm mentioned for \$250,000. The Exploits river runs through the areas which contain several water powers suitable for pulp mills.

Manchester is likely to figure prominently in the pulp export trade of Canada to England, judging by the following arguments in an article in "Our Western

Empire" on the Manchester Ship Canal: Here we have (in the pulp trade) one of the most characteristic of Canadian industries. It cannot be very long before Canada, with her vast forests and marvellous water power, will control the wood pulp trade of the world. And as this trade develops, nothing can hinder Manchester from becoming the leading importing port, for the simple reason that it is the centre of the most important district of paper-making; there are, in fact, far more paper mills around Manchester than any other port. The canal offers many advantages. The toll on wet pulp (50 per cent. of water) is only 2s. 6d. per ton, on dry, 3s. No charge is made for landing to cart or train, but if landed on quay, 9d. per ton; for warehousing, including delivery, 1s. 6d. For storage the rent charge is 1s. 2d. per ton per week. There is no difficulty in obtaining quick despatch by rail, the principal companies bringing their trucks alongside the quays; but for the various paper mills of the Manchester district, the excellent inland canal communications will be found most suitable, as ocean cargo can be discharged over-side into barges and so conveyed direct to the consumers' factories. Before starting, however, the pulp can be tested directly from the ship by several recognized public analysts on reasonable terms, these tests being generally accepted by buyers as a basis for invoicing.



THE MOORE ROTARY SCREEN.

A screen which is rapidly growing in popularity as it becomes known to the trade is the Moore Rotary Screen, manufactured by the Jenckes Machine Company, of Sherbrooke, Quebec, the well known makers of pulp-mill machinery. The Jenckes Machine Company have but recently secured the right to manufacture this screen, and are now the sole Canadian licensees, and have already built two of them for the St. George Pulp & Paper Company, St. George, New Brunswick. Five more are at present building in the shops,

three for the Canada Paper Company, Windsor Mills, Quebec, and two for the Sturgeon Falls Pulp Company, Sturgeon Falls, Ontario.

An illustration of the Moore Rotary Screen is shown herewith. The screen is made entirely of metal, with the exception of the wood step which steadies the bottom end of the cone and supports a small portion of its weight, merely enough to make a tight joint between the screened stock chamber and the sliver chamber, the main weight being carried by the ball-bearing in the head. The screen is entirely enclosed, the only moving part visible being the



driving pulley on the top, which runs at sixty-five revolutions per minute, and requires about two horse-power for its operation. The floor space occupied by the screen is about seven feet by seven feet, and the height nine and one-half feet. The inverted cone frame, which carries the screen plates revolves easily, resting on a bearing of hardened tool steel, and rolling on fourteen one-inch steel balls. The screen plates are of brass, made in sections, perforated with holes eighty-five one-thousandths of an inch in diameter, smaller or larger at the option of the purchaser, and are secured to the steel screen frame with brass button-head machine screws, so that any section may be easily removed without

ese screens is now turning out forty-

interfering with the others. Two man-holes of ample size are provided in the top head, for access to the interior of the screen.

Stock enters the screen at the bottom by means of a six-inch pipe, which rises straight up in the centre of the screen, terminating within a couple of inches of the top head in a neat cap. Discharge pipes of smaller diameter radiate from the main pipe, and discharge the stock against the screen plates on all sides, as the screen revolves about them. The outside of the screen plates is kept constantly clean by means of a brass shower pipe, which is placed on the inside of the outer case, and from which streams of water play continually on the surface of the screen plates revolving before them, and thus permit a maximum amount of stock to be screened. The screened stock passes downward and out through the opening in the side of the screen, shown in the illustration, and the slivers and other screenings down the inside of the inner case, passing out by the elbow, also shown in the cut.

No expensive foundation is required for the machine, one sufficiently strong to sustain the weight of the machine itself, together with the strain of the belt, being entirely adequate. The weight of the screen is about five thousand five hundred pounds. The Jenckes Machine Company guarantee that the Moore Rotary Screen, as built by them, will give more pulp per horse-power expended than any other now on the market, quality being equal, and are ready to put them into the mill of a responsible firm on sixty days' trial, the screen to be accepted only if satisfactory after that trial.

A word as to the output. One of five tons of pulp (ground-wood process), per twenty-four hours with an expenditure of less than three horse-power. This exceptionally fine performance is not, of course, guaranteed for every screen, but none that has been turned out so far has produced less than twenty tons per twenty-four hours of screened mechanical pulp, and the majority handle

more. The manufacturers will be pleased to furnish further information.



THE PULP INDUSTRY IN QUEBEC.

The following is a summary of an interesting paper on the "Pulp Industry and its Development in the Province of Quebec," recently read before the Insurance Institute of Montreal by Fred. W. Evans, of Westmount.

Paper is of very great antiquity, it has been traced back to the second century B.C., when the Chinese reduced the cotton plant to pulp for making paper; although probably the earliest manuscript in existence is Arabic, dating from A.D. 866. Thereafter its use rapidly increased till by the latter part of the fourteenth century it was general throughout Europe. Paper has always been made from the pulp of vegetable fibres of some kind and results from their deposition on wire or other mesh while suspended in water. The Chinese reduced cotton to pulp, and we to-day cut down our forests and convert them into the same material. Many different substances have been used in the interval, the principal one being rags, esparto grass, old rope, jute, straw, etc, but we may safely say that the bulk of the writing and printing paper is made from wood pulp and rags, the fine grades of the former containing the largest proportion of rags, while newspapers are manufactured entirely from wood pulp in the proportion of from 75 per cent. to 85 per cent. mechanical to 15 per cent. to 25 per cent. chemical. Paper was originally made entirely by hand, the first machine was invented in 1798 in France; and used in a mill near Paris. It was introduced into England in 1804 by the Messrs. Fourdrinier, from whom the present paper machine takes its name. Paper mills had however existed in England since the 16th century, when the first known to have been established was built by one Tate in Hertfordshire. On this continent, the first paper machine was started in the United States by Messrs. Gilpin in 1820, and at present the bulk of the paper used is machine

made, though hand-made paper is manufactured for special purposes. The product of a mechanical pulp mill is quite different from that of a chemical mill and is not used for the same purpose; mechanical pulp is much coarser than chemical, and is used chiefly for news and wrapping papers, chemical is used either alone or in combination with mechanical for fine writing paper, book and engraving paper—it has a much softer and longer fibre, and when bleached is a purer white than the other.

Spruce is the great factor in the successful production of pulp. I do not mean that it is the only wood that can be used for the purpose, but it possesses qualities that no other wood has, and it seems to come to very great perfection in the Province of Quebec. There are three varieties, white, red and black, the first makes the whitest pulp and the last has the strongest and toughest fibre. Balsam makes a more mealy short fibred pulp, but it is usual to mix about 25 per cent. to 33½ per cent. of balsam with spruce, which gives a very satisfactory pulp. Poplar and aspen are also used and make a very white and smooth but not strong pulp, the wood however is very subject to black heart, which if not removed before it is put on the grinders fills the pulp with specks and destroys it. Hemlock is used to a very slight degree, it is hard to grind, splinters, and makes rather poor pulp. It appears that the slower the growth the tougher and more suitable is the wood, and this would account for the superior excellence of the spruce in Canada, which like Norway and Sweden (up to the present time the great centre of the pulp industry) is in northern latitudes, and consequently the trees mature more slowly than in countries to the south.

Pulp mills cannot be satisfactorily run by any other power than water, and its quality and volume is of the greatest importance in the economy of the pulp mill; every process in the manufacture is a wet one, and to ensure success the water should be clean and particularly be free from iron, which if not removed passes into the pulp and fills it with small black

specks. A pulp mill requires a great deal of power, about 75 h.p. being necessary for every ton of pulp made for the grinding process alone, so that an ordinary mill grinding 25 tons dry would take about 1,900 h.p. and about 5 h.p. per ton for driving the other machinery, equal in all to over 2,000 h.p. The grinders are preferably connected directly to the wheels, not by belts or gearing, as in other kinds of manufacturing, so that the wheel may always run at the proper speed for grinding, about 200 revolutions per minute. The first process in the mill is to get the log of wood into the sawing and barking room. This is generally done by means of a conveyor or endless chain with hooks on which the log is placed, and which carries it up and lands it on the carriage of the saw. This carriage or cradle is so arranged that the operator draws it against the saw, and the wood is cut into lengths of about 24 inches. The wood as it is cut falls on another conveyor which carries it to the barkers. The barker is a revolving disk about 52 inches in diameter, carrying four knives set in its face; as the disc revolves the wood is brought into contact with it and gradually turned round so that the knives remove every particle of bark; the pieces as they are cut off fall inside the iron frame which surrounds the disc and are blown by a fan through a pipe which is connected with the frame and generally leads to the boiler house. The log having now been sawn to the right length and cleaned from all bark and other substances which would show in the pulp, is ready for the grinders. These are connected with the wheel generally in sets of two or three, but, where great power is available, five or six, the shaft from the wheel is run horizontally and operates directly to each grinder. The grinder is a very heavily built machine, in which a grindstone about 54 inches in diameter and from 18 inches to 26 inches face revolves at about 200 R.P.M. Three pockets made of iron are placed at equal distances from each other in the frame, these pockets are square, having in the side a door through which the wood is placed in them, and at the end a piston rod operated by hydraulic

pressure and having a square face the size of the box which maintains a steady pressure on the wood at about 15 lbs. per square inch, keeping it constantly in close contact with the revolving stone. The capacity of a grinder will generally be from three to five tons per twenty-four hours.

When the pulp and water leaves the grinder it passes along in troughs and through perforated plates which prevent large splinters and chips from going through. From thence it is pumped to the screens. These are boxes containing plates cut in fine slits varying from .012 to .014 inch and upwards so arranged that air and water are forced upwards through the openings or slits and on drawing back again the pulp is sucked through and what is too coarse to pass is left on top of the plates and removed. From this action the screen is known as the suction screen, the other types of screens are the knocker screen, operated by vibration, but so noisy that its use is now practically discontinued, and the rotary screen, consisting of fans driven at high speed inside of perforated cylinder and operating on the principle of the centrifugal dryer; so far this latter has not been a success, though it is claimed that a screen of this type lately introduced has solved the difficulties hitherto met with. From the screens the pulp passes to the wet machines, here it is received in a vat in which revolves the cylinder mould. The outlet to the vat is so arranged that the water in which the pulp is suspended passes through the wire of which the mould is made, leaving the pulp spread in a thin layer on the surface, it then comes in contact with the running felt, fastens itself thereto and leaves the wire. The felt carries it along between the pressure rolls, which being acted on by powerful springs take out a great deal of the water, it is then deposited on the top roll of the machine, and after this acquires a sufficient thickness it is cut off. This is done either by running a sharp stick across the face of the roll or by having a knife, known as the doctor, set at right angles to it, operated by a lever, which brings it against the roll and severs the sheet of pulp; in either case this falls on

the table in front of the machine. Here it is taken in hand by the machine tender, folded, and if intended for use in Canada, is generally shipped in this condition, containing from 35 to 45 per cent. of pulp and the balance water.

The bulk of the pulp manufactured is however intended for shipment either to England, Europe, or the United States, and after leaving the wet press is placed in the hydraulic press, where it is subjected to a pressure which reduces the quantity of water to from 45 per cent. to 50 per cent. In mills where paper is also made the pulp does not go through the wet machines at all, but after coming from the screens passes direct to the beaters of the paper mill to be mixed with whatever other stock is being used for the particular class of paper which is to be manufactured. In some mills, especially the Sault Ste. Marie and Belgo-Canadian, the pulp goes over the hot rolls, which extract all the water, and it comes off as thin sheets, which in the case of that which is intended for shipment to France and some other parts of Europe are perforated in passing over the rolls, this is done to comply with the customs requirements of those countries which insist that the sheet of pulp must be perforated so that it cannot possibly be used as paper, so particular are they that even the way in which the holes are to be distributed over the sheets is laid down.

In the making of chemical pulp there are two principal processes, soda and sulphite. The latter is the one chiefly employed; the wood is prepared the same as for mechanical pulp, but after being barked the knots are bored out and it is put into a chipping machine which reduces it to small fragments which are screened to remove all knots or other objectionable matter. The acid having been carefully prepared is drawn from large tanks into the digester, which has been already filled with the wood chips; steam is turned on and kept on for some twelve hours, when the wood is digested and blown into tanks. It is then well washed to remove acid, screened, passed through the machine and comes out as chemical pulp.

For the economical production of pulp

three things are necessary, an abundant supply of spruce, never failing water powers, and good shipping facilities. The Province of Quebec possesses them all: our black and white spruce forests are larger than those of any other country in the world, in fact the only two which can be compared with it are the United States and Scandinavia, and both these, more particularly the United States, are rapidly depleting their wood supply, while the Province of Quebec has enormous areas which are practically untouched. The failure of the wood supply in the United States constitutes however a danger to this country. American paper mill owners, realizing the possibility of a curtailment and even a stoppage of their supply of raw materials, have been looking across the border for relief and in addition to purchasing wood from jobbers, have been buying up immense areas of timber limits, building mills for sawing and peeling the wood, and are shipping it by rail or boat to their mills across the line. To the casual observer this appears a desirable business—to sell our wood and at the same time clear our lands, and prepare them for the plough, but for such a conclusion is very superficial. Pulpwood exported as such represents a value of about \$4 per cord to the Canadian, the same cord of wood if manufactured here into a ton of mechanical pulp is worth about \$12, a large part of which is for labor. A ton of chemical pulp requires two cords of wood, and is worth about \$30. If, therefore, the pulpwood exported last year to the United States had been manufactured into mechanical pulp, the Province would have been over \$3,000,000 richer, and the gain would have been still greater if made into chemical pulp. Nor is the loss sustained by the country in exporting raw material instead of more or less finished goods the only one, Canada is endeavoring to sell pulp and paper to Great Britain particularly, and in a less degree to Germany and France, the Americans are trying to do the same, and are therefore competitors in the same market—we are to-day supplying them with the raw material to produce the pulp and paper to compete with us. But even this is not

all, this industry in the United States is practically a huge combine and their policy is to limit the amount of paper and pulp placed on the home market to a specified quantity and slaughter the balance in foreign countries; so that the Canadian manufacturer often has the mortification of seeing American-made paper and pulp for which the raw material has been furnished by Canada, going to Europe, perhaps in the very same steamer as his own, to undersell him in that market.

Now the remedy for this state of affairs is very simple, and the Americans themselves say that they cannot understand why Canada does not adopt it. It is not perhaps necessary to enact the drastic measure which the Government of Ontario has taken with regard to their timber lands, viz.: that purchasers must manufacture it in Canada, though the enforcement of this Act has transferred the saw mill industry from the South to the North shore of Lake Huron, and built up a thriving business on Georgian Bay. The more moderate expedient of imposing an export duty on logs and pulpwood would have the effect of increasing the cost of raw material to such mill owners in the United States as were unable to change the location of their plants, and thus reducing their chances of successfully competing with Canadian mills while paying a respectable sum into the Dominion Treasury. It would also bring into Canada a large number of other manufacturers who would purchase our waterpowers and erect new mills. There are in the United States at present 255 pulp mills, mechanical and chemical, producing daily some 8,450 tons or over two and a half million tons per annum. This means a consumption of about 13,000 cords of wood daily, or nearly four million cords per annum. Of this it is computed that the Province of Quebec furnished last year about 400,000 cords, and from the preparations made this winter it is believed this quantity will be nearly doubled in 1903. It is, however, most difficult to get accurate figures of the quantity and value of pulpwood exported annually, as the Government returns are useless, much of the wood go-

ing out as cordwood. Some idea of the rapidity with which the wood lands are being denuded of timber may be gained when we consider that the consumption of wood in the United States last year for the production of pulp would have taken the timber from an area of over 1,100 miles, or say equal to the distance between Montreal and Toronto for a width of over three miles and this consumption is rapidly increasing. It is said that one New York newspaper is asking for tenders for two hundred tons of paper per day, which will take the produce of 9,000 acres per annum to fill the order.

In spite of the lack of assistance in this direction from successive Governments, whether Conservative or Liberal, the pulp industry has grown very rapidly in the province of Quebec. In 1880 there were a few scattered mills whose combined output did not exceed 9,000 tons per annum, and of which the only ones of any importance were those of the Canada Paper Company, and W. & F. P. Currie, now the Dominion Paper Company. To-day there are in the province 27 mills, the estimated output of which is about 280,000 tons per annum. Of these the principal are the Chicoutimi at that place, the Laurentide at Grand Mere, the Belgo-Canadian at Shawinigan Falls, James McLaren & Company at Buckingham, the Royal at East Angus, the Canada at Windsor Mills, the Riviere du Loup and Fraser-ville at Fraserville, the Eddy Company at Hull, the Lachute Mills and small mills scattered over the Province. In addition to these, large mills are under construction at Brompton Falls and at Seven Islands, and others are projected at the Greys and some other points on the St. Maurice.

Here, then is an industry which in twenty-three years has increased from an output of 9,000 tons to over 280,000 tons, which when the mills now projected or under construction are completed will reach over 330,000, and yet is only really in its infancy when its future possibilities are considered. In 1901 Great Britain imported one half million tons of pulp valued at eleven and three

quarter million dollars, of which Canada furnished 13 per cent. or just exactly double the proportion we had exported there two years previously. The United States in the same year took from us 51,000 tons valued at \$1,635,000, and we appear to have furnished about 79 per cent. of their total import of wood pulp. Our exports to other countries were inconsiderable, totalling only about \$65,000. It would therefore appear that we have in Great Britain an unlimited market for wood pulp, for if the whole output of the mills now operating and under construction in the Province of Quebec were shipped there, we should only be furnishing about 60 per cent. of her imports, and as I have already shown that Canada, and more particularly this Province, has all the requirements for the production of the best pulp at the lowest possible price, we should take every means to conserve our raw material and not allow it to be sent out of the country to aid our rivals to successfully compete with us.



CANADIAN PULP INDUSTRY IN 1902.

George Johnson, Dominion Statistician, reporting on the wood pulp industry of Canada in 1902, states that the industry was carried on at 35 mills, which had an output of 240,989 tons of wood pulp. Of this quantity 155,210 tons were mechanical pulp, 76,735 sulphite, and 9,041 soda. The corresponding quantities for 1901 were: Mechanical, 169,360 tons; sulphite, 84,500 tons; and soda, 10,740 tons. This shows a decrease of 24,611 tons in 1902. The decrease is thus distributed: Sulphite, 7,765; soda, 1,696; mechanical, 14,150 tons. The total value of the output of 1902 was \$4,383,182.

There are several large mills in course of construction, or which, though finished, did not operate during the year 1902. Two or three firms have gone out of business, or manufacture only paper where before they made pulp. Nine of the thirty-five mills manufacture sulphite pulp and four soda pulp. Twenty-five manufacture mechanical pulp, and four make both chemical and

mechanical. Taking the returns of 32 mills, the average time the mills ran during the year was ten months. The power to drive the mills is chiefly derived from water. Of a total power equal to 81,725 horse power, 78,296 is water power.

The growth of the industry is considerable. In the census of 1881 there were five establishments, with an output of \$63,000. In 1891 there were 24, with an output of \$1,057,810. The census returns for 1901 have not been tabulated. For 1902 the returns to the statistical branch preparing the year book show, as given above, 35 establishments, with an output of \$4,383,182.

Of the product of Canadian mills the customs returns show that during 1902 the export amounted to \$2,511,664, leaving \$1,871,000 for home use. In a general way, therefore, about 57 per cent. of the production is exported. Of the \$2,511,664 worth exported by Canada in 1902, Great Britain took \$976,192; the United States, \$1,598,139; and other countries, \$17,333. The market for this product in the United Kingdom is large. In the calendar year 1902 the requirements of Great Britain were of the value of \$11,671,367, of which seven-elevenths were chemical pulp. Canada's export in 1902 to Great Britain was about $8\frac{1}{2}$ per cent. of her needs.



MR. MONK ON THE PULPWOOD QUESTION.

Speaking recently at a dinner in his honor, F. D. Monk, a leading opposition member of the Dominion House, said on the pulp wood question. "There is not the slightest doubt that if our Government wanted to be careful of our national industries and to adopt a truly Canadian protectionist policy, we would have twenty-five establishments like the Laurentide Company at Grand Mere in no time, and that Canada would be the paper centre of the whole world in ten years. That would mean a capital of \$100,000,000, and also \$25,000,000 in wages for Canadian workmen." Mr. Monk went on to say that the Grand Mere Company paid \$100,000

annually in wages, produced 100 tons of paper per day, 125 tons of ground wood pulp and 70 tons of sulphite pulp. Wood at present brought but \$3.50 per cord, plus the small sum collected by the Government. In the States \$7 is spent to convert it into ground pulp, and \$15 to convert it into sulphite. When the cord of Canadian wood is made into American paper, \$40 has been spent upon it. Why not have the difference between this \$3.50 and this \$40 per cord spent in Canada among Canadian workmen. It is needless to add that Mr. Monk is in favor of an export duty on pulpwood.



THE B. GREENING WIRE CO.

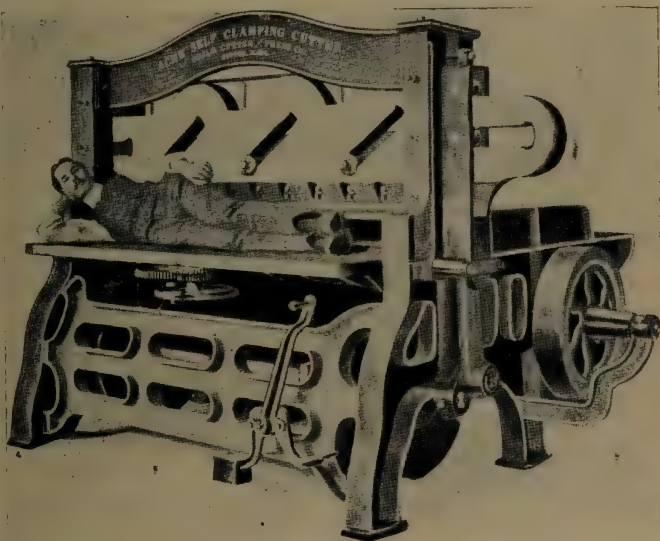
The works of the B. Greening Wire Co., Limited, of Hamilton, have been extended very much during the last twelve months. Besides the handsome new offices now occupied by an increased staff, there is a three-story brick building put up this year for the manufacture of poultry netting. The product of this branch is sold up to its full capacity. The weaving plant has been largely added to, and a new tower for painting fly cloth has been erected. This firm has now been manufacturing wire rope and weaving heavy wire cloth for upwards of fifty years, and are the pioneers in that line and in wire drawing in Canada. Wire is made here for all purposes, such as wire rope of different grades, wire cloth from the heaviest steel mining screens, slab or refuse burner tops for sawmills; all kinds of drying floors, such as oatmeal and malt kiln, wooden and cotton drying floors, for grain cleaning machinery in grist mills, threshing machines and fanning mills, down to the finest wire cloth; also perforated metals in steel, zinc, brass, copper and aluminum, and, in fact, everything that can be made in wire. The Messrs. Greening are descendants from an old family in England that have always been in the wire business, Nathaniel Greening having started the firm that is in existence to-day at Warrington, England, in 1799. The present firm here was started by Benjamin Greening, in 1858.

and incorporated by his son, S.O. Greening, president of the present company, in 1889. The firm has a warehouse at 422 St. Paul street, Montreal, with J. H. Hanson in charge.



The Child Acme Cutter & Press Co., of 33, 35, 37 Kemble Street, Boston, Mass., are manufacturers of the paper cutter illustrated herewith, concerning which the makers make the following claims: "This is the strongest and heaviest cutting machine manufactured,

Andrew's near Lachute Que. in 1803, United States, then to Canada belongs the credit of the first paper mill on the continent of America. A paper mill was established on the river Rouge, at St. Andrew's near Lachute, Que., in 1803, just a hundred years ago, and Bouchette referring to it some years later said, that Mr. Brown, the proprietor, made all the different kinds of paper required by the trade. The second mill appears to have been established at Bedford Basin, near Halifax, N. S. in 1819, by A. R. Holland, publisher of the Halifax Recorder, and



and is especially designed for paper mills, lithographers, and all those who have the toughest and hardest materials to cut. Compactly built. All the gearing between the frames entirely out of the way. Table low for convenience in handling stock. Quick moving registering back gauge. Steel bearings and heavy cut gears and steel shafts. It is without a rival for cutting large, heavy stock. It is made in sizes from 32 to 72 inches."



HISTORICAL NOTES.

If Mr. Evans is right in the statement made in his paper on the pulp industry of Quebec, printed elsewhere, as to the date of the first paper mill in the

the first in Upper Canada was probably that at Ancaster in 1820. In 1827 Lower Canada had three paper mills, and by 1842 no less than fourteen mills were in existence in Upper Canada.

So far as our information goes, Canada also had the first wood pulp mill. Dr. Little, the chemical mill expert, of the present firm of Little & Walker, Boston, was, we believe, the pioneer in the sulphite process in the United States, having started the Richmond Paper Co., of Providence, R. I., in 1884, as the first sulphite mill in the United States. Ekman of Bergvick, Sweden, had developed the process and had been running for several years before that in Sweden, and afterwards came to the States to start the Ekman Pulp & Paper Co., of Northfleet. There had been chemical fibre mills in the States

before this; but the Canada Paper Co., had a 6 ton pulp mill of this class in operation in 1865, and actually exported 50 tons of unbleached and 50 tons of bleached fibre to Great Britain in 1874. at which time the product was untried by any mill in England or Scotland. Canada, therefore, has the honor of first introducing chemical wood pulp to the British paper mills. We believe that ground wood pulp was made before 1865 by the Buntin Mills, at Valleyfield, Quebec.



GREAT BRITAIN AND THE U. S. IN THE CANADIAN PAPER MARKET.

The unrevised statement of imports into Canada for the nine months of the fiscal year to March, 1903, show that the United States is maintaining a large preponderance in the exports of paper to Canada, as compared with Great Britain. The following are some of the items of imports into this country:

Imports for 9 months ending March, 1903.	From Gt. Britain.	From U.S.
Paper bags	\$ 102	\$17,148
Cardboard	965	26,660
Envelopes	6,463	18,826
Strawboard and felt...	395	50,563
Strawboard in sheets or rolls	473	2,853
Wall papers	14,766	121,081
Leatherboard	33	12,953
Millboard	1,343	18,005
Pads and papier mache	63,257	255,138
News print (costing 2¼c. or less)		2,394
Other print paper	69,647	188,431
Ruled and coated papers	17,671	52,668
Wrapping papers	1,629	15,930
Other papers	98,153	236,618

In the matter of exports from Canada, it appears that no pulpwood was shipped to Great Britain in this period, but pulpwood to the value of \$1,169,896 was shipped to the United States. The quantities, in cords, are not given, but if they were, it would be found that the recorded amount is far below the actual amount, owing to the quantities that go out under other classifications. Under the head of papers, exclusive of wall

papers, we shipped to Great Britain in the nine months \$282,282, to the United States, \$32,003, and to other countries, \$324,981, all being the produce of Canada, besides a small quantity not made in Canada. In wood pulp our exports to Great Britain were \$886,095 in the nine months, to the United States, \$1,269,994, and to other countries, \$220,202, making a total of \$2,376,291.



PERSONAL.

Earnshaw Bradley, C.E., a well-known paper mill engineer, formerly of Montreal, has returned from a visit to Los Angeles and has taken up his residence at 497 Euclid Ave., Toronto.

W. D. Dixon, paper bag manufacturer, of Markinch, Scotland, is now on a visit to New Brunswick, in connection with the business of the St. John Sulphite Pulp Co., of which he is a director.

Forbes Wood, superintendent of the paper mills of the Carew Mfg. Co., of Hadley Falls, Holyoke, Mass., has been appointed superintendent of the Toronto Paper Mfg. Co.'s mills, at Cornwall, Ont.



It is stated that Price Bros. & Co., lumber merchants, of Quebec, will build a pulp mill on the Aux Sables river near Ha-Ha! Bay, where there is a fall of 250 feet.

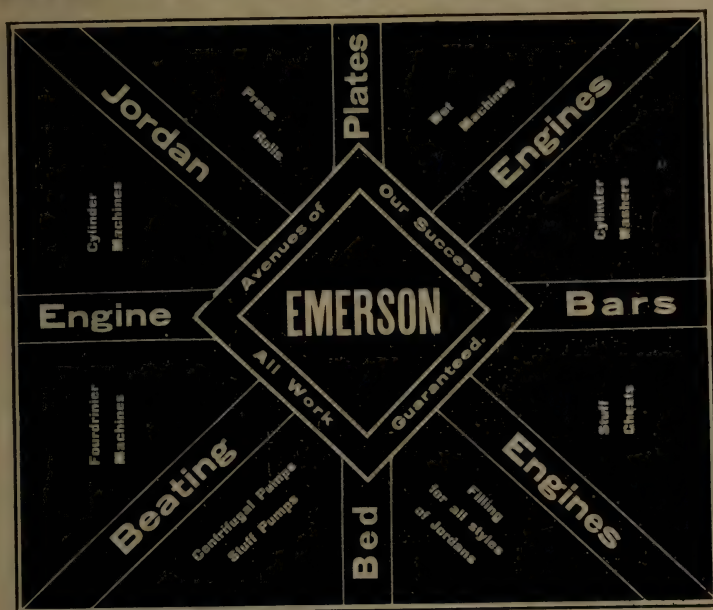


Hon. Sidney Fisher is advised from Japan that a large market is opened for Canada in the "England of the East" not only in lumber and flour, but in pulp.



Since the death, two or three months ago, of James Stutt, Sr. proprietor of the Wentworth Paper Mills at West-Flamboro, Ont. the sons have decided to go out of business, and the principal hands employed have already been discharged, and the mill closed. The mill had a capacity of 2½ tons a day and produced paper felt chiefly. It was one of the oldest mills in the province. It is reported that the sons contemplate going into the manufacture of salt, from salt beds or wells found in the vicinity.

EMERSON MFG. CO.



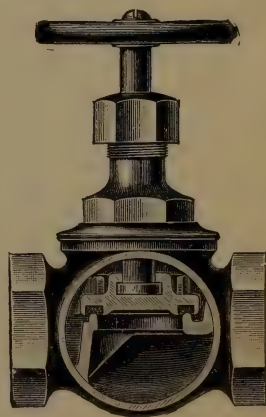
LAWRENCE, = = = MASS. ^F

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Asbestos Disc
Globe Valves.

ARE YOU USING THEM ?

*Write for Circulars
and Particulars.*



The Fairbanks Co.,

MONTREAL. WINNIPEG. VANCOUVER. ^F

Established 1842.

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SPRINGFIELD, MASS.

... Manufacturers of ...

FOURDRINIER WIRES

Cylinder Molds, Dandy Rolls

also

Brass, Copper
and Iron Wire Cloth

Sole Manufacturers of the BELL PATENT FLAT WIRES for Book Papers. F

Market Notes.

The Toronto and Montreal markets for rags and paper stock are active just now. While country mixed rags are not bought so freely this month, there is a steady demand for paper stock as well as for cotton rags. Quotations in Toronto are as follows:

	Per cwt.
Mixed country rags	\$ 60 to 80
Mixed cotton rags	90 to 1 00
New colored cottons	2 00 to 2 50
New white cottons	3 00 to 3 50
Mixed paper	30 to 35
Book and ledger	50 to 75
Colored paper shavings ...	45 to 50
White paper shavings	1 00 to 1 50

The New York market for rags is reported to be brisk, both for new rags and old. Paper stocks are active, and straw boxes have advanced $2\frac{1}{2}$ to 5c. Notice has been given of an advance of $\frac{1}{2}$ c. in Nos. 1 and 2 jute wrapping twines and in marline jutes and

two grades of B. C. hemp twines. Gunny, old rope and bagging are slow of sale and less than 75c. has been paid.

Reporting the New York wood pulp market, the Paper Trade Journal says:

"The market is still reported firm, with the asking price at \$14.50 f. o. b. pulp mill. From this figure it is difficult to "budge" the manufacturers, so the middlemen say. The latter claim that there are "stacks" of ground wood at the mills, but that the manufacturers are holding on to it, as they expect a long season of dry weather, since the past three months were so rainy.

New York quotations for chemicals are: Imported china clay, \$10.50 for spot and \$11.00 to arrive; Alkali 75 cts. for light and 80c. for dense, f.o.b. works; for delivery May and June, 85c. for light, 90c. for dense; caustic soda, \$1.70 to \$1.75, for both immediate and forward delivery; sal soda, 55c.; lump alum, \$1.65 to \$1.70, ground alum, \$1.75 to \$1.80. Bleaching powder unsettled,

Liverpool brands ranging from $1\frac{1}{8}$ to $1\frac{3}{8}$ c. and domestic $1\frac{1}{8}$ c.



BRITISH PULP MARKET.

Regarding the home pulp market, Paper & Pulp of 15th April says: There has been a slump in the mechanical pulp market. During the winter, makers have been holding out for high prices, with the result that practically no business was transacted. Now that the mills have plenty of water again, we presume stocks are accumulating, and moist pine is freely offered at kr. 30 f. o. b., or say 40s. c. i. f. U. K. Of course there is nothing out of the ordinary in this state of affairs as it happens every year about this time, but what we cannot understand is why Norwegian makers should make business impossible during two or three months of the year. It cannot be to their advantage to do so, more especially as there are 100,000 tons to come from Canada this year. A considerable amount of business has been transacted in chemical pulps, both for this and next year, at the prices which have been ruling for some time past. These are roughly for sulphite £7 to £7 10s., and for soda £6 15s., £7 5s., c. i. f.



The Imperial Paper Mills Co., at Sturgeon Falls, hope to be turning out 45 tons of paper per day, by the end of May.



It is expected that the new pulp mills at Metabetchouan, in the Lake St. John district of Quebec, will be in operation next autumn.



The Brompton Pulp & Paper Co., whose large brick pulp mills have been in construction at Brompton Falls, Que., are creating quite a village at that point on the St. Francis river. This company, which is controlled by the same men who are principal owners of the Odell Manfg. Co's mills at Groveton, N. H., propose to go on this summer with the erection of the paper mill contemplated in connection with the pulp mill.

It is reported from St. John's, that a syndicate of American and Canadian capitalists, headed by Henry Melville Whitney of Boston, has purchased two million acres of pulp lands in Newfoundland, and intends to build large saw and pulp mills. The syndicate paid over \$1,000,000 for the property.



The Rainy River Pulp & Paper Co., Ltd., has secured a pulp-timber concession from the Ontario Government, subject to the conditions imposed on enterprises of this kind. The concession has an area of about two-hundred and seventy square miles, including lakes and rivers. The Island Falls on Sand River, which runs through the centre of the concession, has also been secured for the use of the company. The provisional directors are: Hon. George E. Foster, Toronto; W. J. Elliott, barrister, Toronto; William Blackwood, brewer, Winnipeg; R. M. Simpson, M.D., Winnipeg; L. Hamel, manager Miners' Supply Co., Mine Centre, Ont. and W. A. Preston, Mine Centre, Ont. The company is now making preliminary surveys of mill-site dams, flumes, etc., and intend erecting a thirty ton mechanical pulp mill and a fifteen ton chemical plant. They will put up a good permanent saw-mill, with planing-mill, lath-mill, and other attachments. They will cut the lumber and timber required in the construction of their buildings, and do a general lumber business in connection with their pulp enterprise. They expect to have the saw-mill in operation in the spring of 1904, and the pulp machinery in place by the spring of 1905. A spur from the Canadian Northern Ry. will be run into the works. It is the company's intention after getting the plant in operation, to increase the capacity of their works very materially. The area of the concession is covered with a unique forest composed of banksian pine, poplar, balm-of gilead, spruce, tamarac, cedar, and red-pine. This concession is situated on Rainy Lake, and lake steamers can touch at the Co's works, which will be below the Falls.



Beloit Iron Works

Paper Mill Machinery.

Guaranteed the most serviceable and efficient
of any built.

Modern Designs, New Patented Ideas,
Used Exclusively by us.

Cylinder and Fourdrinier Machines.
Tissue Paper Machines a Specialty.

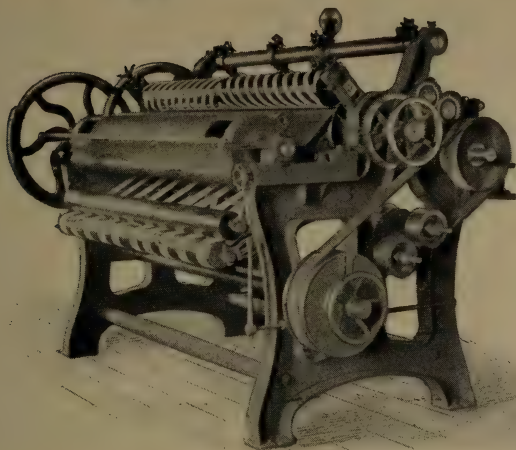
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BELOIT, WIS. U. S. A.



Our Specialty

Revolving Paper Cutters



The Hamblet Machine Co., LAWRENCE, MASS.

Successor to Dustin Machine Co.

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CAN'T IMPROVE THEM

We've tried it but we are forced to admit that there's no room for improvement in

"DURHAM" RUBBER BELTS

The large and increasing demand proves that their merits are recognized.

If you are in the market we know that our samples and prices will interest you. Drop us a card.

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BOWMANVILLE, ONTARIO.

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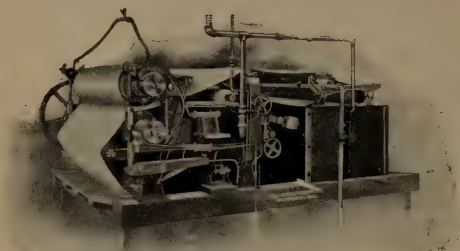
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CANADIAN REPRESENTATIVE :

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50 BAY ST., TORONTO.

We can unreservedly recommend our

HYDRAULIC WET MACHINE



Here shown,
to any
and all pulp
manufacturers.

We will be glad to answer any enquiries about this or other Pulp
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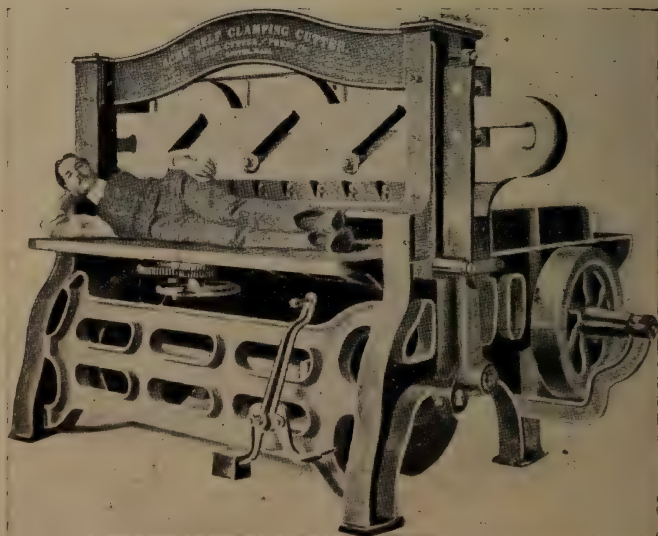
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Sherbrooke, Que.

Acme Paper Mill Cutter.



Automatic Self-Clamping Cutter.

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WIRE PULP MATS

Perforated Copper, Brass and Steel.

WIRE ROPE = All Kinds. F

Wire Guards for Mill Windows. Refuse Burner Cloth, etc.

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DICK'S Balata BELTING.

The Strongest Belt in the World, and specially
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LARGE STOCK always on hand.

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Waste Paper. Rags. Rope.

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Agent for Canada and U. S., - - J. CHRISTIE,
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MONTREAL AND TORONTO

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BRONZE and BRASS CASTINGS, from 1 oz. to 20,000 lbs. in weight.

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The Largest Fourdrinier Wire Plant in the World

Foreign PHOSPHORBRONZE Fourdrinier Wires,
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Old Plates re-closed by our process are practically as good as new and give
better results than by any other process.

We shall keep on hand at our Sherbrooke Works a large stock of the different
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Papermakers' Engineers ...

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The Newest and Most Up-to-date Machinery
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EMBRACING BRITISH, AMERICAN AND CONTINENTAL IMPROVEMENTS

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Steel and Bronze Tools for Pulp and Paper Mills.

roll bars and plates.
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**Mills Built and
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CHEMICAL EXPERTS and ENGINEERS

SPECIALISTS IN

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Designs for

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Paper, Pulp and Fibre Mills, Examination of
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Mutual Reserve Building, - 309 Broadway,
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"Asbestine Pulp" Filler

Superior to any Clay.

Delivered price on application.

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Drainer Stones



The Klary and Snell Patent Drainer Stones are made of the most durable material, and are proof against acids or bleaching agents; smooth on both sides, and do not soil stock. Send for description and a list of Canadian and United States Mills using them.

SAMUEL SNELL, Holyoke, Mass.

The Oriental Co., composed chiefly of Vancouver people, who got pulp-wood reserves on Princess Royal Island, has sold its rights to an English syndicate, which has put surveyors at work to locate and select its areas. These areas must be defined within nine months, in order to secure the lands. Report credits the company with the intention of spending \$1,500,000 on pulp mills.

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ENGINEER
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Paper, Pulp and Sulphite Fibre Mills

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YOUNG MAN (34), with seven years' experience in shops and drawing office of paper machinery builders in Britain and eleven years as draughtsman and engineer with paper machinery and water wheel builders in the States, at present holding position as superintendent for the latter firm, would like suitable position in Canada. Address H. B., care Pulp and Paper Magazine.

Situation Wanted

MACHINIST desires position; fifteen years' experience. Capable of introducing the system of embossing rolls. Address H. C., care of Pulp and Paper Magazine, Montreal, Que.

The Island Power Co., of Vancouver, has sold its pulp-wood concessions to an English corporation, which contemplates putting over \$1,000,000 in pulp mills.

It is stated that a large paper mill is to be built this summer, at Mille Roches, near Cornwall, to make the finer grades of paper, and that M. P. Davis' power at that point will be utilized. A company is now being formed.

A German firm of paper makers are placing on the market a substitute for cotton waste in the cleaning of machinery. It is a highly absorbent and flexible paper. It is claimed that it is cheaper, much more absorbent, no threads, no dust, and gives the machinery cleaned with it a lustrous appearance.

CHINA CLAY. **ROSIN,**

Best Paper
Makers' Strained.

Bleaching Powder. Soda Ash.
Ultramarine Blue.

STARCHES—Highest Grade Pearl
and Potato.

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F. T.

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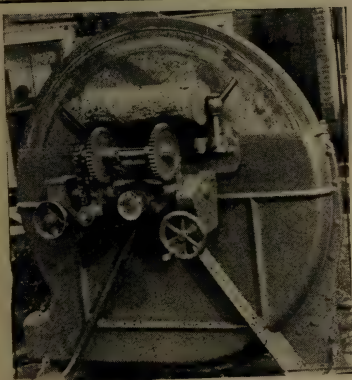
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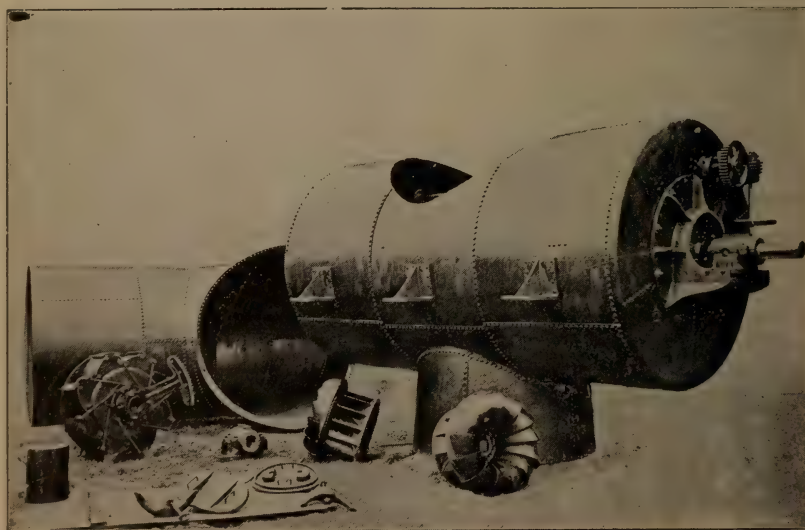
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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 2.

TORONTO, JUNE, 1903.

{ \$1 A YEAR.
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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

SUBSCRIPTIONS: Canada, Great Britain and the United States, \$1 a year; to Foreign Countries, 5s. a year.

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THE SITUATION.

At the time of writing, Ontario, Quebec, and the Maritime Provinces are being blessed with good soaking rains, following a drought of eight to ten weeks, and these rains will not only extinguish the forest fires that have been ravaging the pulp woods of Eastern Canada, but will help to raise the diminishing streams to normal level. While it is said that the damage by forest fires has been relatively greater in the Eastern States and New York than in Canada, it will be impossible to determine this for some time yet; but the combined effect of drought and fires has been to increase the price of pulp by \$4 to \$5 in the past month, and this effect would have been still more marked had it not been that many of United States mills have

greatly increased their grinder capacity in the last two years. This has been done in order to take better advantage of the high water season; and consequently such mills have a larger quantity of pulp in stock, so that pulp is not likely to go up to \$30 a ton, as it did four years ago. Canadian pulp, however, is selling at \$23 to \$24, delivered at mills in New England and Eastern New York.

As an indication of the extent to which the paper mills of some sections of the United States are already dependent on Canada for pulp supplies, it may be noted that the mills of the Watertown district derive four-fifths of their supplies from the Canadian side. In the matter of raw material in the form of pulpwood, it is estimated that the total annual consumption of United States mills is 1,600,000 cords of spruce, and 400,000 cords of hemlock, of which Canada furnishes 400,000 cords of spruce, besides the equivalent of 200,000 cords imported in the shape of pulp.

It will be remembered that the Board of Appraisers of the United States customs handed in their decision, in March last, in the pulpwood cases, affecting primarily the provinces of Ontario and Quebec. Under the Quebec regulations the holders of licenses to cut timber on crown lands pay a stump-

age of 65 cents a cord, but if the wood is made into pulp in Canada, and the pulp exported, a rebate of 25 cents per cord is allowed. To nullify this slight advantage which Quebec pulp mills would have had, the board of appraisers have confirmed the assessment of an additional duty of 25 cents, which had been made in these cases by several United States customs officers. As to the importations of the same class of pulp from Ontario, the board ruled that as the regulations of that Province prohibited the cutting of pulpwood on crown lands unless it is manufactured into pulp in Canada, it was not an export duty in the case of Ontario. As Ontario did not levy an export duty, such imports from that Province are not subject to the countervailing duty. But as it is not so easy to trace the source of such imports along the borders of these two provinces the United States customs officers are already in a snarl in some cases. The motto of the Ontario Government is "Build up Ontario," but the motto of Premier Parent of Quebec is "build up the United States," and the affable gentleman must be delighted to see the fruits which his policy is beginning to yield for the benefit of his friends. Premier Parent must be grateful to the United States board of appraisers for a decision which will help along the good cause. It is enlightening to find in this hard world at least one Prime Minister whose altruism soars above the selfish interests of his own people.

However, this decision of the Board of Appraisers has been appealed against and the appeal is to come up before a court in New York, on the 29th inst. And now we have yet another ruling of a United States customs officer, by

which pulpwood from Canada, when "rossed" or peeled in a "barker," is declared to be a manufactured article, and therefore dutiable at 35 per cent. If this ruling is followed up in other ports of entry, it will mean that pulpwood which now costs the United States mills \$2.25 a cord, will hereafter cost them from \$5.50 to \$6 f.o.b., inasmuch as the rossing of the wood takes 20 to 25 per cent. off the weight, and if the United States importer has to pay freight on bark and waste, he will have a new problem to face.



THE UNITED STATES WOOD SUPPLY.

In discussing the outlook of the timber supply in the United States, in a series of articles in the Forestry Quarterly, B. E. Fernow, director of the New York State College of Forestry, gives some interesting facts. Ten years ago the Chief Geographer of the United States Geological Survey rather belittled any attempt to promote a more rational forestry policy, on the ground that the timber growth renewed itself faster than it was being consumed. As the officer who furnished the forestry statistics for the late census, he provides facts which go to show that his position ten years ago was wrong, and that without a rational system of reforestation the supply of timber is diminishing.

The census of 1900 shows that the consumption of lumber amounts annually to forty billion feet B. M., of which thirty-five billions is the capacity of the saw-mills and five billions represents the unenumerated, that is, staves, heading, railway ties, telegraph poles, etc. The saw-mills produced from raw material, valued at \$226,000,000, a product valued at \$423,000,000. Pulpwood is not included

in the above statements, but it is estimated that it would add over 2,500,000 cords of log or bolt size. The consumption of pulpwood has more than trebled during the last decade.

Notwithstanding the enormously increased production of coal, iron, steel and other substitutes, which take the place of wood for fuel, construction purposes and other uses, the per capita consumption of wood has increased, the result of higher civilization and increased industrial activity. Whence is this increased supply to be obtained? Partly from a more careful preservation of the home supply, but mainly from importation. Canada is looked to largely to supply the demand, especially for pulpwood. But shall we allow our pulpwood to be exported? Shall we not rather insist upon its being made into paper here? This is one of the coming problems for Canadian statesmen, and it ought to be taken up, not in the spirit of antagonism to United States manufacturers, but solely as a question of domestic concern. The problem is how are we to preserve the pulp forests of Canada, so that our raw material of the pulp and paper industry shall not be prematurely exhausted, because with the exhaustion of our pulpwoods the manufactures depending upon it will languish and die. This is primarily a question of self-preservation, and secondarily a question of the development of two great industries for which nature has specially endowed this country. The wanton waste of these inestimable assets by forest fires, such as have occurred this summer, and by the still more wasteful management of Provincial Governments, will surely bring home to the consciousness of our public men the fact that this great question has heretofore been ignored or, at most,

trifled with. Will those entrusted with the management of our timber lands wake up to a sense of the magnitude of the interests committed to their charge or will they wait till the raw material is so far swept from our grasp that the Canadian pulp and paper industry will be emasculated in the crucial stage of its development?



—A feature of the Canadian pavilion at the exhibition recently held at Osaka, Japan, was an exhibit showing the process of pulp and paper making from the spruce tree to the finished paper. It is hoped that this will result in the placing of orders for Canadian paper and pulp from Japanese newspaper and paper merchants, who will be able to ship by the C.P.R. steamers direct from Vancouver. Some of the projected mills in British Columbia should be able to handle this export trade to the east to good advantage.



—A paragraph in our news columns refers to the difficulty of determining the degree of moisture on pulp shipped abroad, but no one has yet come forward with a practical scheme for satisfying both buyer and seller, except by having an umpire or expert at one end or the other whose decision shall be accepted as final. Each bale may differ slightly at the time of shipment from the mill, and evaporation must not only go on from the time it is tested at the mill, but it proceeds in a varying degree, so that while the buyer's test will show a difference in moisture to that made at the mill, both are right. The acceptance of a test at the pulp mill would seem to offer the simplest solution, some agreed upon allowance being made for evaporation.

—It is said that the experiments carried out at Orange, Texas, for turning into pulp the shavings of yellow pine that are turned out as waste from saw-mills are successful. The planer shavings are fed into the digesters, the soda process being used. As usual with new experiments, difficulties are encountered, and the present equipment of the mill does not achieve the best economy. For instance, the liquor is now allowed to run to waste, but, by installing a recovery plant, it is said that nearly 90 per cent. of the chemicals can be recovered for use again. It is said that the pulp produced by this process makes a very strong paper, and can be used for other classes than wrapping paper into which it is now made exclusively. The drawback to this venture is that the amount of waste available from these mills is relatively very small, and while the yellow pine logs can be more profitably turned into lumber, we shall not see enough of this pulp on the market to produce any effect on the paper trade in general. A process lately exploited in the Western States for making paper from corn stalks and corn husks, may be put in the same category. The paper experimentally produced is said to be strong and tough, and may, no doubt, be used to advantage for making paper for special requirements in various manufacturing processes, but it, like the pine shavings paper, is not likely to be made in quantities and at prices that will make it a serious competitor of spruce paper.



—In his last annual report addressed to the Minister of Trade and Commerce, the Canadian High Commissioner in London mentions that he has directed the attention of British capitalists to the openings in Canada for profitable in-

vestment in pulp manufacturing. Our High Commissioner is a man of great business ability, and is unsparing in his efforts to promote the interests of Canada at all times, and by all fair means; and yet he may live to regret the advice he sincerely gives on this subject. We do not mean by this that there is any question about Canada's future as a pulp and paper manufacturing country. Indeed, it is just because Canada's coming supremacy in this line of manufacturing is manifest destiny that we have doubts about the advisability of specially exerting ourselves to force the rate of progress we are now making. We own to be influenced seriously by the caution given by Mr. Chisholm, president of the International Paper Co., of New York, in a communication to this magazine, last month, on the pulp manufacturing situation. Mr. Chisholm evidently looks beyond the local, or Canadian and American, aspect of the trade, and has an eye on the world's paper trade, in uttering his caution. The demand of the world's paper trade considered as a unit, though large, has its limits, and there appear to be signs in the European market that the supply of pulp is overtaking this demand in some lines, and in others exceeding it. Looking ahead to pulp and paper manufacturing as a permanent specialty of Canada, it would seem to be safer to let the world look to Canada for its needs than for Canada to be begging for trade in a chronic condition of over-production. In other words, Canada need not hasten this over-production, or be the seat of its greatest excess. Of course, times of over-production will come to every trade, but in those times, the survival of the fittest will be determined not merely by capital, but by the advantages which nature gives to a coun-

ry. Nature has endowed Canada, as a whole, with overwhelming advantages on two points—that is unlimited permanent water powers, and almost unlimited raw material in spruce and other forests, while our laboring population is not behind any in the world in industry and intelligence. But these advantages are not distributed over every part of the country alike in the two respects first mentioned, so that for the export trade the number of safe investments is not unlimited even if the supply and demand were always nicely balanced. Judgment should in the first place be used in the location of mills built for the export trade, and in the second place, the pulp market of the world should be carefully watched by prospective investors. While nature is with us we will stand the stress of competition in a time of depression all the better if we move ahead steadily and wisely. We need not dislocate the world's pulp and paper trade too suddenly, or too rudely, just to demonstrate the fact that Canada can "make Ossa like a wart" in these lines.

The High Commissioner's report on the pulp industry is on the whole very instructive, and we commend the attention of readers to extracts given elsewhere in this issue, especially the letter quoted on the relative advantages of making sulphite and mechanical pulp for export.



LORD STRATHCONA ON CANADA'S PULP AND PAPER TRADE.

The following are some extracts from the annual report of Lord Strathcona, High Commissioner for Canada in Great Britain, on the pulp and paper industry of Canada. On the general condition of trade he says: "The wood pulp importations from

Canada seem to be increasing. The feeling prevails that an effort should be made by Canada to prevent the exportation of the raw material, and to encourage the industry in the Dominion. This gives expression to the feeling that generally obtains, that the matter is largely in the hands of Canada, as the possibility of competition from other sources is decreasing year by year."

On the question of ground pulp versus sulphite pulp, he says: "Some surprise is expressed that the development in Canada so far should have been all in the direction of mechanical wood pulp, rather than in sulphite. The trade in the latter in the United Kingdom is much larger than in the former, the quantities consumed being about the same, namely, 250,000 tons, but while mechanical pulp is shipped containing 50 per cent. of water, chemical pulp is shipped air dry; consequently the actual amount of fibre in sulphite is almost double that in mechanical."

He then quotes the following letter from a British firm on this matter: "We must strongly urge for future developments in Canada of properly organized sulphite mills, and there can be no doubt that the future of sulphite making lies in Canada. Our reasons for this statement are the following: 'We have seen that Canadian mechanical pulp mills can compete successfully with Scandinavian. The only advantage they have over the Scandinavians is a modern plant and cheap wood, and the disadvantages under which they labor are the extra freight rates.' Now the wood necessary to make a net ton of mechanical wood pulp in Scandinavia costs on the average 11s. per ton; and in the best situated mechanical mills in Canada is said to cost 6s. a ton. A Canadian mechanical wood pulp maker, therefore, starts out with an advantage of 5s. per ton wet; against this he has an extra freight to pay of 5s. to 6s. a ton, at an optimistic estimate, and therefore has no present great advantage, except that of modern plants, over his Scandinavian competitors. But reversing the position to chemical pulp

making, the wood necessary to make a ton of chemical pulp costs in Scandinavia 60s., because the bulk of wood boiled is boiled away; reckoning the wood costs \$3 a cord at the mill, it would cost the Canadian only 30s. for his wood to make a ton of pulp, and leaves him an advantage of 30s. per ton. Against this he would have an extra freight to pay on dry pulp of 7s. 6d., and he starts out making pulp with a certainty that he can get his raw material so cheaply that he can manufacture 20s. to 22s. per ton less than the Scandinavians. The answer to this argument is of course, 'Why don't the existing mills do it?' and the reply must be that, whereas any intelligent man can become a fairly expert pulp grinder in six months, in sulphite-making great experience is required, and many a man who has been a sulphite maker all his life cannot make sulphite at the end. The sulphite maker, like the paper maker, is born, and the workmen who can be obtained in Canada are not sufficiently experienced, and do not take the care requisite in the manufacture of a good sulphite pulp. All these are difficulties which can be overcome and Canada is to-day making no fair share of the sulphite of the world, and it is in this direction that it will be a pleasure for the writer to convince Your Lordship that the future development is possible."

In another letter a well-known London paper agent gives the High Commissioner this advice: "As regards paper and pulp—particularly the latter, in which I am more interested—there is very little to report excepting the scarcity of Canadian paper on this market during the last twelve months. Prices have been very low here, and I believe trade has been exceptionally brisk in Canada, and consequently makers were largely kept busy on the home trade. This, however, merely shows how small the paper-making industry in Canada is compared with what it might be when a little extra demand on the home market practically monopolizes the output of the Canadian mills. What news paper has been received here

('news' is practically the only grade as yet imported from Canada) has been of good quality and generally liked. It is astonishing that developments do not take place more quickly and that a big effort is not made to capture this market. I have, during the last year, had opportunities of comparing the possibilities of Canada in the pulp and paper business with those of Scandinavia, and have been forced to the conclusion that Canada has little or nothing to fear in the matter of quality, at any rate from Scandinavia. The wood there is much more difficult to get at, and is, as a rule, of poorer quality, and only to be had from trees of small growth. It is much more knotty and generally a great deal more costly to handle. So far as Norway is concerned, it has practically no forests left, and I should say that in Scandinavia generally the growth is much slower, and, as a rule, the cordage per acre is very small as compared with that of Canadian forests in the eastern provinces. It can be safely said, I think, that within ten years' time, unless conditions change in an extraordinary manner, Norway will be exhausted, and Sweden nearly so, as far as pulpwood is concerned. I would like to suggest, that in order to attract pulp and paper manufacturers to Canada, the leases of limits should be put upon a permanent basis. The present arrangement of having to renew leases under what is practically a competitive system does not attract capital and it is absolutely essential to attract the best class of makers to give a permanent security in this way."

Another correspondent who is a pulp dealer, takes a very different view as will be seen from the extract quoted: "We would like to add a word in regard to paper-making. There is much talk of paper-making in Canada, but the difficulties that attend the manufacture of paper in an out-of-the-way place are not understood, or they would never be contemplated for a moment. The damage in transit alone to paper in reels amounts to something like 15 per cent. Besides this, all that can be urged

against the manufacture of sulphite in Canada in the way of lack of experience, can likewise be urged in paper-making, only doubly and trebly so, and it would be possible to show clear figures and absolute proofs that it would be better for a mill to locate its mechanical pulp mill where there is water power, its sulphite mill where there is wood, and the paper mill to convert it into paper where its market is. Thus, in ventures of this sort we should strongly urge (and could give you good proofs of the argument) anybody desiring to go into the paper trade should make his pulp in Canada and his paper in England."

RAINY LAKE PULP CONCESSION.

In the last hours of the session of the Ontario Legislature, the terms of a concession granted by the Provincial Government to the Rainy Lake Pulp & Paper Co., Limited, were made known. The charter members of the company are Wm. Blackwood, brewer, Winnipeg; Robt. M. Simpson, Winnipeg; Wm. A. Preston, capitalist, Mine Centre, Ont.; Hon. George E. Foster, Toronto; Wm. J. Elliott, barrister, Toronto, and Louis Hamel, merchant of Mine Centre. The agreement sets forth that the company has acquired a water-power on the Sand river, in the Rainy River district, and intends to use the same to operate pulp and paper mills; and the company asks the right to cut wood on Crown lands for pulp manufacturing for which it has deposited \$5,000 with the Government, as an evidence of good faith. The company undertakes to spend \$75,000 in buildings, and to put up a pulp mill of not less than twenty tons per day capacity, and to employ at least 50 hands; this mill to be in operation within two and a half years. In consideration of these engagements, the Government grants to the company "for use in its business the right for a period of twenty-one years to cut and remove spruce, poplar or whitewood and banksian or jack pine six inches and upwards in diameter to enable the company to work the said mill and any extensions thereof

to its full capacity from those portions of the lands of the Crown on which the said woods may be found, and which may be at any time unoccupied, unlocated or unsold, commencing at the mouth of Little Turtle river, at the southwest angle of Mining Location H. P. 138; thence north astronomically seventeen miles; thence west astronomically sixteen miles, more or less, to O. L. S. Niven's sixth Meridian Line; thence south along said Meridian Line fifteen miles, more or less, to Red Gut bay of Rainy lake; thence southeast one and a half miles to the northeast angle of Indian Reserve 26 A; thence south along the said east limit of the said reserve one-half a mile; thence due east seven miles, more or less, to the intersection of the north limit of Mining Location G. 70, with the water's edge of Little Turtle lake; thence easterly along the south shore of Little Turtle lake; to opposite the southwest angle of H.P. 138; then northerly to the place of beginning, as shown on map attached hereto, excepting therefrom all mining locations patented or leased within the said territory, and also Indian Reserve No. 26 C." The company is to pay 40 cents per cord for spruce, and 10 cents per cord for other woods, the Crown having the right to revoke the license if the terms of the agreement are not carried out. The agreement is not to impede settlement or mining operations on the land referred to, which can be sold or leased to settlers or miners as if the agreement had not been made. Public use of the river is not to be interfered with, but the Government agrees not to grant the right to cut pulpwood within this territory to any other company within the twenty-one years. The agreement does not confer on the company the right to cut pine timber for lumbering purposes, unless the other woods have been exhausted, and then only on terms that may be arranged with the Government. The Government meanwhile reserves the right to grant timber cutting licenses for other woods than pulpwoods. Settlement is to be made with the Government at the close of navigation for the

woods cut each season. The deposit shall be forfeited if the company fails to put its mill in operation within the time specified, but the deposit is to be returned to the company when it has spent \$15,000 on works. The company agrees not to deposit sawdust or chemicals into the river, and the cement and machinery to be used in the works shall be of Canadian manufacture, "so far as the same is reasonably practicable." The company agrees not to sell unmanufactured pulpwood to any other persons.



SHARPENING STONES.

To obtain wood pulp of fine fibre and free from splinters, it is important to know what material the stones are made of, in order to be able to sharpen them according to their hardness and grain. Badly sharpened stones produce a pulp that is coarse and full of splinters, and the faults of defective grindstones are thus thrown upon the refiner to redeem. This, however, is not by any means a satisfactory way out of the difficulty, for apart from the waste of power incurred, the coarsely ground stuff has a tendency to cling between the grinding surfaces of the refiner. Moreover, it heats and becomes converted into brittle, so-called "dead-ground" pulp, having the appearance of a slimy mass, which exerts the most injurious influence upon the healthy fibres of the pulp; pulp made in this way being more likely to decompose than a pulp of good fibre direct from the engine. A German paper says a sharpening hammer, suitable for sharpening stones, consists of interchangeable chilled plates held by jaws in a steel yoke; it is extremely easy to manipulate, and satisfies the most exacting requirements demanded of a stone sharpening-tool.



—The reorganization of the North American Lumber and Pulp Company, which has been progressing for some time, has been completed, and the interests represented by Henry Patton, the Albany lumberman, have now control.

The Nova Scotia properties of the Company are in Cape Breton.



A peculiar occurrence which may bring about a curious legal complication, has arisen along the Salmon River between Malone, N.Y., and Dundee, Canada, where it empties into the St. Lawrence. The burning of a sulphite pulp mill at Malone, about twenty-five miles south of Dundee, allowed the contents of the digesters, a solution of sulphuric acid, to escape into the stream. An investigation by the State Board of Health discloses the fact that every fish in the river from Malone to its mouth has been killed, tons of them being found at Constable, Westville, and Fort Covington, in New York, and at Dundee, Canada. The residents of Dundee use the water for cooking and drinking purposes, and threaten to sue the town of Fort Covington because the officials there flushed the dams and let the dead fish go down the river to Dundee, where the stream is slow and sluggish. The Fort Covington people claim they are not to blame because the accident occurred at Malone.



Speaking of the new paper mill at Sturgeon Falls, the St. John's News remarks: At Sturgeon Falls, in the Province of Ontario, a large pulp and paper mill is in course of erection. The pulp will be manufactured into paper right on the spot, and 500 hands will be employed. It is anticipated that the population of the town will be increased by 2,000 within a short period. If the pulp were shipped to the United States and finished there, the gain for Sturgeon Falls would be small compared with what it will be under existing circumstances. Two thousand new settlers means a new market for the farmer worth in the vicinity of \$160,000 per annum. Here is a practical illustration of what manufacturing means for the agriculturist. What is being done at Sturgeon Falls can be duplicated at many points, provided that adequate encouragement is given to investors.

PULP GUARD FOR BEATING ENGINES.

Hugh A. Hall, of Lawrence, Mass., has patented in the United States a pulp guard for beating engines.

Fig. 1 shows a portion of one side of the vat provided with a pulp guard. Fig. 2 is a cross section on the line *xx*, Fig. 3, the roll shaft being omitted. Fig. 4 is a plain view of the pulp guard shown in Fig. 2. Fig. 5 is a vertical section of a beating engine provided with pulp guards.

in the sides of the vat, in which the shaft 3 is located, said slots being of slightly greater width than the diameter of the shaft and of sufficient depth to permit vertical movement thereof to the desired extent. Base plates 8 are secured to each side of the vat adjacent to said slots *a*, said plates being correspondingly slotted, so that they do not overlap any portion of said slots. A guide plate 9 is provided for each base plate, each guide plate having flanges 10 at each side thereof, which

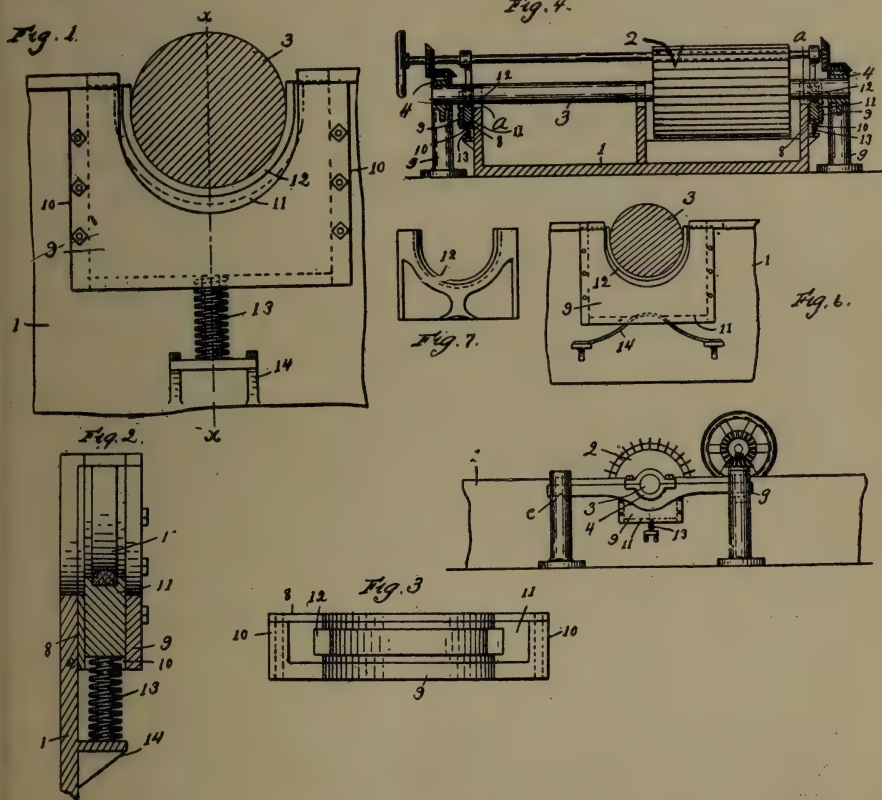


Fig. 5 is a side view of a beating engine provided with the invention. Figs. 6 and 7 are views of a modified form of pulp guard embodying the invention.

The vat 1 is provided with the usual beating roll 2, which is supported by shaft 3, the outer ends of which are journaled in bearings 4, said bearings being supported outside the vat and being vertically adjustable by any convenient and well-known means, as shown, *e.g.*, in Fig. 5. Slots or recesses *a* are provided

rest on and are bolted to the plates 8, thereby forming a rectangular shaped passage, which is open at the top and bottom. Each plate 9 is also provided with a slot corresponding in size and location to the slot *a* in the side of the vat. A flat stop plate 11 is accurately fitted between the flanges 10 of each guide plate 9, and between the inner side of the guide plate and the corresponding base plate 8, said plate 11 being adopted to freely slide there-between. The middle portion

of each plate 11 is provided with a semi-circular recess in its upper end of slightly larger diameter than the shaft 3, and the curved surface of said recess is grooved to receive a packing 12, of hemp or other suitable material, said packing extending slightly above the surface of the plate (see Figs. 1, 2 and 3) and closely fitting about the under portion of the shaft 3. A spring 13 is supported on a fixed bracket 14, secured to the side of the vat in position to engage the lower edge of the plate 11, and thereby act to hold said plate constantly in engagement with the under portion of the shaft 3 in whatever position said shaft may be adjusted in the slots *a*. The plates 11 when in this position completely close the openings in the sides of the vat between the shaft and the bottoms of the slots *a*, and as said plates 11 are held closely against the base plates 8, the pulp is prevented from being expelled through said slots *a*. A flat spring 14 may obviously be used in place of the coiled spring 13, as shown in Fig. 6. It is claimed that this device will keep the opening below the shaft tightly closed for an indefinite period without attention, as the wear on the iron parts is practically inappreciable and the wear on the packing is taken up by the spring.



SCANDINAVIAN PULP TRADE.

The Christiania correspondent of the Paper Trade Review writes:

The restriction in output of mechanical pulp in Scandinavia, so much talked about, has at last become a fact. At least 80 per cent. of Norwegian and Swedish pulp makers have now entered into the agreement about reducing their usual production by one-quarter during one year from May 15th. The mills are to stop from Saturday noon until Tuesday morning every week. The few offers which are coming to hand lately are as shockingly bad as possibly can be, and a certain loss to all producers. They work out to something like Kr. 26.50 to Kr. 28 f.o.b. per ton. No doubt many of the exporters will seize the opportunity,

if at all possible, to stop their mills altogether during the summer months, instead of running them some days of the week during the whole year. The true cause of the low prices—over-production in wood pulp—have been shown up very clearly during the last few months, and it is to be hoped that the Scandinavian industry in the immediate future will find some other objects than the erection of new mills.



PULP AND PAPER.

(Quebec Chronicle Editorial).

A new monthly magazine has just made its appearance, published in Montreal and Toronto, entitled the Pulp and Paper Magazine of Canada. The industry for which it speaks, and whose interests it is intended to advance, has already its organs in the United States, and the step now taken was, as its promoters truly claim, inevitable at some period, in view of the fact that Canada possesses the raw material and the facilities for its manufacture to an extent unequalled by any other nation, if not equal to the materials and facilities possessed by all the other nations of the world combined, the spruce of Canada being calculated by the Dominion Statistician to occupy an area of four hundred and fifty million acres, and the total water power of Canada being estimated at forty per cent. of that of the entire water power of the world. It is plain, therefore, that an industry resting on such a substantial basis of what we may term natural capital, must necessarily increase by leaps and bounds when it was once embarked on, and that in order to conserve its best interests, and to ensure its intelligent administration, an organ such as the one under present notice would be established. It is one that will as a matter of course command the support of those immediately engaged in or interested in this industry, but it is also one that should have a wider field, and the general public will find in it much to interest and much to guide it in forming the opinions which will materially affect the

policy of the country with respect to it. Hitherto, there has been little opportunity for outsiders to gain practical information sufficient to form an intelligent judgment on issues which are vitally important to the growth and prosperity of the country, and, indeed, the life of the industry has been so short a one, only recognized in the trade and navigation returns since 1890, that while the public has a hazy and indefinite idea of the magnitude of the interests involved, nine men out of ten would be astonished to learn how great this really is, and the drawbacks which prevent the country from benefiting to more than a comparatively insignificant extent by the vast resources placed by nature at its disposal. They have been told indeed that under the present policy pursued

adian pulpwood were sent into the United States, for which, in rough numbers, \$1,200,000 were received here, and \$10,800,000 went to pay wages for American workmen, which might just as well have been expended on this side of the line. Nor does even this statement put the case fairly before the laboring classes of the country, for the \$1,200,000 represent the value of the raw material and the Government duties, as well as the money paid out in the lumbering camps, while nine times that amount is paid out purely and simply for the conversion of the raw material into the manufactured article.

The contents of the magazine before us, a handsomely got up periodical of 32 pages, on good paper, and in clear type, form instructive reading, and give



Power Plant and Pulp Mill of Spanish River Pulp and Paper Co. at Espanola, Ont.

by the Government, pulpwood bought in Canada for about four dollars, Government duties included, is taken into the United States, and there converted into paper with which to compete with our own factories at a further expenditure of thirty-six dollars, and they are ready to assent to the proposition that it would be much better if the raw material was retained in Canada, and the extra thirty-six dollars spent among Canadian workmen, but the assent is only a languid one, and has had no influence on the electorate, because the quantity mentioned is only a cord, and the sum dangled before their eyes is not imposing; matters would wear a different aspect if the case was put differently, and Canadian laborers learned that in the year ending June 30th, 1902, about three hundred thousand cords of Can-

a great deal of valuable information. Of course, a great part of this is purely technical, but in addition to this, there is much to commend itself to the general reader, and especially to those who take a warm interest in the prosperity of the country, and who believe in making the most of the marvelous resources it possesses.



THE COMING WOOD FAMINE.

The world is using wood faster than the forests are producing it. This means that the forests are disappearing, and that ultimately we shall not be able to get what we want. Aside from the question of aesthetics, therefore, or the still more practical one of the regulation of the flow of our rivers, which has been

shown to depend so largely on forests, the Literary Digest thinks there is every reason why we should try to treat our wood crop like any other. Only we must remember that it is not a matter of a season, but of long years—a forest can not be grown in a few months like a crop of wheat. And even in Europe, where scientific forestry has been much more generally practised than in this country, the cry is now going up that good wood for building and cabinet-market is getting scarce. A writer in the *Musee Commercial* (Rouen, France), says:—

"If we examine official statistics. . . we may easily convince ourselves that most European countries, especially industrial countries, do not produce the quantity of wood that they need. England has to call on foreign aid more than any other country; she imports nearly 500 millions of francs (\$100,000,000) worth annually. Other countries, better endowed by nature, have to make the same appeal to their neighbors, Belgium for 100 million francs (\$20,000,000); Germany for 350 millions, (\$70,000,000); Switzerland for 15 millions (\$3,000,000); Spain and Italy for 30 millions, (\$6,000,000), France imports 140 millions, and exports 40 millions, and thus finds herself in arrears 100 millions (\$2,000,000). In Europe, the only countries that have to-day an excess of exports are the Austrian empire, Norway, Sweden, and Russia. In these countries, therefore, are found the reserves of wood, to which we must add, in the New World, those of the United States and Canada.

"When we compare the commercial movements of the past twenty years, . . . we shall become convinced that the demand for wood for manufactures has increased during this period, and as the product of the forests has not increased in the same proportion, we may conclude that the amount of wood in the world has grown less. Demand for wood is increasing considerably. When we say that since the introduction of metal into construction

wood is no longer sold, we should add that the kind of wood that no longer sells is firewood, which can not compete to-day with more economical combustibles, such as coal, coke, and gas. But wood is used more and more in manufactures, and for certain kinds, notably wood for paper pulp, the development of the market is considerable. With us (in France) there is a great excess of firewood, which sells with difficulty, and an insufficiency of wood for manufacture. To have at our disposal a large quantity of wood it is first necessary for the owners of forests to enter upon habits of foresight. The Government should take restrictive measures against the lack of it; for instance, the Swedish Government has forbidden in certain provinces the cutting of trees before they have reached a certain stage of growth.

"In what degree should we encourage the intervention of the state in this matter? What reforms should be made in the management of our forests, and what provision should be made for the future by the reforestation of uncultivated land. Every one recognizes that it is for the public interest to take hold of these questions and provoke discussion on them."



EXPORT DUTY ON PULP WOOD.

The necessity of an export duty on pulp-wood, if the paper-making industry of Canada is to reach its proper measure of expansion, says an exchange, was illustrated by an object lesson recently, when two large pulp and paper mills, located on the American side of the border line, but which draw their entire supplies of pulp-wood from Canada, were inspected by their shareholders. Had it not been that these mills could obtain their pulp-wood free of duty in Canada, both plants would have been located on this side of the boundary line, and the expenditure of wages, etc., would have redounded to the advantage of the Dominion. As it is, all that we receive is the meagre pittance paid for the raw

material we furnish. The profits of its manufacture into the finished article are reaped by American citizens.

According to the Paper Trade Journal it was in October, 1900, the Remington-Martin Company, a concern capitalized at \$300,000, began the development of the excellent water power on the Raquette River, at Norfolk, and an old dam gave way to a new structure 400 feet long and 22 feet high. From this dam a flume 1,600 feet long leads to the mill, where under 46 feet head nearly 5,000 horsepower is developed. The mill buildings are of concrete and steel construction, and there is an abundance of room in every department. The machine room contains the largest paper machine in the world, a 164-inch Fourdrinier, and also a 100-inch machine of the same style. The speed at which the big machine was being run and the fine quality of news turned out were wonders to those who were not posted on the latest improvements in paper making machinery. The sulphite and ground wood plants in this mill are as good as can be constructed. The Remington-Martin plant is now turning out 50 tons of news per day, 30 tons of sulphite fibre, and 45 tons of ground wood.

The Raymondville Paper Company began the construction of its mill $3\frac{1}{2}$ miles below the Remington-Martin plant in September, 1901, and it was ready to run last August. The mill is built of concrete and steel, and is equipped with a 114-inch Fourdrinier. A dam 525 feet long and a flume 800 feet in length turn the stream to the turbines, which at this point under a 20-foot head develop about 2,000 horse-power. The mill is now turning out 25 tons of finished paper and 20 tons of ground wood per day. The surplus of sulphite pulp made at the Remington-Martin plant is used at the Raymondville mills.

Now whence do these two big mills draw their supplies of raw material. From Canada. The companies own 37,000 acres of land well timbered with spruce in the Province of Quebec. Besides, Manager Moore, of the Raymondville company, is

a director, and several other gentlemen interested in the Norfolk and Raymondville mills are stockholders in the St. Gabriel Lumber Company, of St. Gabriel de Brandon, Quebec, a concern that owns and controls the timber on 168 square miles of land and has an estimated supply of 900,000 cords of spruce pulp-wood. Contracts have been made with the Canadian concern to supply the Norfolk and Raymondville mill for a term of years. To bring pulpwood to the mills and take out the finished product a standard gauge steam road has been built from Norwood, the junction of the Rome, Watertown and Ogdensburg division of the New York Central and Rutland railroads, to the mill doors.

Herein, then, is a striking illustration of the necessity for an export duty on pulp-wood. We have here two large and prosperous mills located on the other side of the line simply because we do not force them to come to this side by enforcing an export duty on our pulpwood. They must have Canadian spruce. Their own forests are already practically denuded. But so long as they can get our spruce free they will manufacture it where it will benefit their own people and not ours. The money put in circulation by these big mills will go into American pockets. Canada will get nothing but the privilege of seeing her spruce recklessly destroyed by aliens who grudge every cent they spend within our borders. And whose fault is it that such a condition of affairs exists? Our own. The remedy lies in our hands. But we have not the common sense to apply it. If we had, there would be as marked an exodus of American paper mills to Canada as there was of Michigan sawmills when Ontario prohibited the export of saw logs.



DUTY ON ROSSED WOOD.

Secretary of the Treasury Shaw has given a new twist to the already strained relations between Canada and the United States in the matter of the importation of pulp-wood from the Dominion. He has

directed that rossed pulp-wood imported from Canada must be classed hereafter as a manufactured article, and subject to a duty of 35 per cent. ad valorem. Heretofore pulp-wood, whether in the natural state as brought out of the forest, or as cut into lengths, or as barked, has been considered raw material, and has been imported free of duty. The Secretary now decides that the rossing of pulp-wood must be considered as a process of manufacture, bringing the wood so rossed into competition with similar manufactures of this country. Whether this is a new move in the game which was begun by the laying of a countervailing duty on wood pulp imported from the Province of Quebec, or not, is a matter that the Treasury officials can best determine. It is also a question whether the imposition of a duty upon rossed pulp wood will not prove more of an annoyance to American manufacturers of pulp than it will be to Canadian exporters of pulp wood. In any event we may expect a loud outcry from Canada in the near future.—The Paper Mill.



PROFITS OF PULP.

Charles B. Campbell, a manufacturer of 18 years' experience, in a recent letter to the Toronto Globe, from Sturgeon Falls, seeks to correct some of the popular illusions about the profits to be made in pulp manufacturing. In the course of his letter he says:—

A pulp concession, according to the popular idea, is the whole thing. With one in possession, all that has to be done is to build a mill, grind out the stuff, and sell it to the Yankees at a fabulous price; the only visible difficulty being to find sufficient space to store away the vast earnings of the plant.

Allow me to make a plain, unvarnished statement about this matter. There is no profit in the manufacture of moist mechanical pulp in Canada, selling it in Great Britain or the United States at ordinary market prices; absolutely none at present prices and little enough at the best price pulp has been in the last ten

years. Only those mills located near tidewater can compete in the English markets and only when prices are abnormally high do we sell in the American market.

First, let us get a correct idea of what a ton of moist pulp really amounts to. Some people have an idea that a ton of pulp is a ton net, that we get paid for a ton, and just pay freight on a ton. As a matter of fact, we only get paid for 800 pounds. That ton of stuff that we ship has only got that amount of dry pulp in it—dry as it is when made into paper, the other 1,200 pounds being moisture or water. On an average, the best modern wet press cannot make it any dryer; sometimes you might gain one or two prints, some other time you lose. The buyer also objects to having it any dryer, and that probably has dampened the invention of better appliances for extracting moisture. The ordinary ton of pulp contains 40 per cent. air dry pulp and 60 per cent. of water. We pay freight on the water just the same, and the railroads cheerfully accept it. Now just figure this out; if you have a 20c. freight rate to a certain point you pay \$4 freight per gross ton; as you have only 800 pounds of pulp in that ton, you will, therefore, have to pay \$10 freight on what you sell as a ton of air dry pulp.

The "Soo" mills, notwithstanding their great shipping facilities, found this such a serious obstacle that they evolved the idea of drying their pulp somewhat on the principle of drying paper. They developed it successfully and have the process well protected by patents. They are the only firm in America that make their ground wood pulp dry before placing it on the market, and from a saving-of-freight-point-of-view it is a great success.

Now about the lucrative business of grinding pulp. I have been connected with the trade for about eighteen years, was once a manufacturer myself, but did not succeed in corraling one of those immense fortunes; in fact, I went broke in the hard times of '96 and '97, trying to make money by selling pulp for \$12 a ton delivered, so I may reasonably claim

to have some knowledge of the subject in hand.

We will say nothing about the cost of a plant; we will just figure on the cost of production and transportation, our location being, of course, in New Ontario, where the spruce forests are.

The cost of getting timber from the pulp areas will average \$4 per cord, much of it will cost more if the Government insists on the literal enforcement of the contracts. A cord of spruce will make 1,850 pounds of air dry pulp, and sufficient timber to make a ton of pulp will, therefore, cost \$4.30. The labor to manufacture it will cost \$2 per ton, and supplies, maintenance and fixed charges, at a low estimate, \$2.20 per ton; total cost of a ton \$8.50 f.o.b. mill. This is the actual cost of putting a ton of pulp on the car at a well appointed mill in Canada.

The market in Canada is very limited, so we must look for purchasers in Great Britain or the United States. In the States prices are variable. In May and June pulp may be selling for \$13 to \$15 delivered, and in August the price may have gone up to \$20, \$22, and even \$25. All depends upon the season; if it be wet the streams keep up and the mills grind enough for themselves, if dry output is shortened and then they buy. A good rainfall will fill the streams again, their own mills resume and the demand ceases. Then, again, there is a difference in prices according to locality. Some points are more accessible to shippers than others, and competition being keener there prices are lower. It is difficult, ~~therefore~~ to select a figure that would represent the average price. For four months in 1901, in New York and New England States prices ran from \$19 to \$22 per ton; for the balance of the year \$15 to \$17 was the ruling figure. Now, supposing that we secured a market in the Black River Valley for our pulp at \$17, delivered. Let us see how we would come out:—Cost of manufacture for one ton of pulp, \$8.50; freight at 18c. per cwt., \$9; duty, \$1.60; total cost delivered, \$19.10; price of pulp delivered, \$17; loss, \$2.10.

We will suppose that we continue this losing trade for eight months, in the be-

lief that during the other four months prices may be such that we would at least even up; and we figure that we will get the maximum price of \$22 per ton:—Eight months, at 25 working days, equals 200 days, or 200 tons; loss on one ton, \$2.10; on 200 tons, \$420. Four months with 25 working days, equals 100 days, or 100 tons; profit on one ton, \$2.90; on 100 tons, \$290. Yearly loss per ton of output, \$130. And this, allowing a better price for pulp than the average. Take the best price that pulp has been in the last fifteen years, which, in 1900, was for a short time \$28, and the profit on that to a Canadian manufacturer would be but \$8.90, a mere pittance, considering the amount of money that is invested to earn it.

The English markets are only accessible to those mills located near seaboard. The Chicoutimi Pulp Company, and a few others, by virtue of their locations, do conduct a fairly profitable business with Great Britain. These exceptions have furnished the argument for those people who can only get one idea into their heads at a time, that Great Britain is the place for us to sell our pulp products. It might be if the water-powers and spruce were all close to tidewater, but unfortunately for the purpose of this thoughtful plan the bulk of the spruce is from 600 to 1,200 miles from the nearest shipping point, and the cost of transportation by rail takes up more than all the profit. Just fancy paying 15c. to 20c. to tidewater, 11½c. ocean rate, or \$13.25 freight in all, and your product costs you \$8.50 to manufacture, and you can only get \$20 for it when you deliver it in Liverpool. It must be remembered that pulp is extensively manufactured in Norway, and freight from there to London is only \$1 per gross ton.

After all, it is much better for Ontario that this situation is forced upon us. Had it been otherwise, and could we have shipped our pulp with profit to Great Britain and the United States, we would probably have been content to develop the industry along that line, and would have eventually exhausted our spruce forests supplying those countries with

raw material (for pulp is a crude product of manufacture). As it is we must make a higher-finished article of it. We can make it into newspaper, wall-paper, wrapping-paper, manillas, board, tissues and other high-class paper products, and save to ourselves the profits of both processes of manufacture, and incidentally 60 per cent. on freight account. The practicability of this amended plan has been proven. It has been the salvation of those pulp manufacturers who were fortunate enough to have the money for the heavier investment of a paper plant. Their success has taught us that with the advantage of cheap timber we can compete successfully in the manufacture of paper products with Great Britain and the United States. This fact has been carefully noted by men acquainted with the trade, and now an effort is being made to develop the manufacture of paper on such a scale that in a few years it will be one of our staple articles of export.

The only great difficulty that has been, and is yet, is to find the capital for investment. It is not in Canada,—if it is, it is not looking for investment in that line. A proposition involving an expenditure of one-half to three-fourths of a million dollars is seldom to be found here. We go to London or New York to look for money, and the inducement that we hold out to those people is that we have plenty of timber in Canada, and that it is cheap. In discussing the situation with them, we have to admit that we have practically no market in Canada, that we will have to export, and that we have long and costly lines of transportation. They will say that our advantage is very slight for aggressive foreign competition, that we will have to contend with the powerful trade organizations of the United States, and that our isolation and local conditions offset our cheaper timber. Some will tell us very pointedly that there is more profit making paper in the United States, after paying \$7 a cord for timber, than there is in Canada by paying \$4, and who can gainsay it?

We concede that the advantage is little,

if any, but we do believe that with a visible supply of timber for a number of years at a known cost, we are at least on an equal competitive footing. We have counted upon the aggressiveness of the American paper combine, we have figured on our freight account, and we are not dismayed at the prospect. We have one grand assurance, namely, an unlimited supply of spruce pulpwood for years to come, and that is the American's uncertain quantity.



PULPWOOD ASSETS OF ONTARIO.

In a recent debate in the Ontario Legislature, J. W. St. John, member for West York, dealing with the timber policy of the Provincial Government, made several criticisms on the pulpwood question. In the course of his speech he said the forests of the province were the greatest sources of wealth that Ontario possessed. If well managed they should furnish the largest portion of the country's revenue. The area of the forests was 142,000,000 acres, the Crown still held 120,000,000 acres; there was under license 14,000,000 and still unlicensed 106,000,000 acres. There was inhabited, tilled, and owned by the people 22,000,000 acres, and these figures showed that Ontario owned one of the largest forestry areas held by any State in the world. But through bad administration, the Government had lost large, valuable tracts by fire, and no provision had been made for the future. If the Government would only study practical forestry and take steps to preserve the forest wealth, they would not have any occasion to juggle with figures to show that they had a surplus. The Government, he contended had given little consideration to the pulp industry. In the Adirondack region only pulp timber from three to fourteen inches in diameter was permitted to be cut, but in this province any size of tree could be cut down and turned into use. Calculating that the spruce tree took fifteen years to reach a diameter of eight inches, it was thus apparent that in every twenty years, at

least, the marketable product of the forests, with proper care, would be doubled. Estimating also the average amount of pulpwood on each acre of spruce forest to be eight cords, and that there were 85,000 square miles of pulp forest in Northern Ontario, the province had a forest wealth which was almost incalculable. Yet this great asset was being ruthlessly sacrificed, as was evidenced in the Spanish River district, where 2,700 square miles of pulp forests had been given away in concessions.

J. R. Barber, of Halton, interrupted to state that the average product of an acre of pulp forest would not exceed two cords, and Mr. St. John's estimate was altogether too high.

James Conmee claimed two cords an acre was an extreme estimate of the product of pulp lands south of the height of land, and four cords an acre was also an extreme estimate of the product of pulp timber on lands north of the height of land.

Mr. St. John, continuing, said he had been assured by the Commissioner of Public Works that along the line of the Temiskaming Railway, from the Township of Osborne northward, there were thick forests of spruce trees 100 feet in height. In a forest of such density it might be expected that one or two hundred cords of pulpwood would be produced from every acre.

Estimating that there were 89,000 square miles of pulp forest in the province, these would produce twenty million tons of pulp. The Government, he went on, should adopt a State policy providing protection to the younger timbers and permitting only the sale of matured timbers to be cut under Government inspection. He hoped the timber of the province would be industrialized into cash for the benefit of the province. He accused the Government of playing into the hands of the large limit holders. What was needed was a progressive development policy for all the timber and mineral resources of the province, so that, for instance, the pulpwood would be made into paper in Cana-

dian mills and by Canadian workmen, and all the nickel and other mineral deposits converted into the finished product. If there was a sound policy in force the country would not witness the spectacle of timber limits being disposed of by the Crown Lands Department for \$250 and then sold for \$9,000.

In closing, Mr. St. John said that if a scientific system of forestry were introduced, as in Germany, the country would become a veritable hive of industry.

The Commissioner of Crown Lands, in reply to the charge that the Government had little or no knowledge of the resources of the province beyond the Height of Land, said a very comprehensive report had been prepared in 1900, which was full of information regarding the country. The member for West York had pointed to the forestry system of Germany as a model, but the adoption of a similar one in Ontario was utterly out of the question, for the reason that Germany spent as much in maintaining her system of forestry as the whole revenue of Ontario amounted to. That the Government was taking every step to conserve the forest wealth was evidenced by the fact that they had set apart the Temagami Reserve of 2,200 square miles.



CORRECTION.

By the accidental dropping out of a line in the article last month, describing the Moore rotary screen, built by the Jenckes Machine Co., Sherbrooke, an erroneous notion of the output of this machine would be gathered. The sentence referring to the capacity of the machine should have read thus: "One of these screens is now turning out forty-five tons of pulp (ground-wood process), per 24 hours with an expenditure of less than three horse-power."



The Laurentide Pulp Co. contemplate a further enlargement of their pulp mills at Grand Mere.



St. Raymond Co.—View of Mill and Falls.

ST. RAYMOND CO.

The accompanying illustrations show the pulp mills of the St. Raymond Co., Limited, near St. Raymond Station, on the Quebec & Lake St. John Railway. John Macfarlane, Montreal, is president; F. W. Evans, Montreal, vice-president

and secretary-treasurer, with offices in the Board of Trade Building, Montreal. Material is received and delivered by a siding from St. Raymond Station to the mill premises. These mills produce mechanical pulp and have five grinders and three wet presses. An extension of the buildings and plant is under con-



St. Raymond Co.—Pulp Logs in Boom.

templation, as at present only about one-fourth of the available water-power is being utilized. This water-power is one of the steadiest in Canada; its supply coming direct from the Laurentian Mountains, and notwithstanding the present extended dry spell, the volume of water does not show any perceptible decrease. The illustrations show the mill and one of the falls from which present power is obtained; the pulp logs in boom, and the falls that are now running to waste.

absorbing the liquid, and the object of the sizing was the filling up of the pores and interstices. It had been ascertained that starch had been used in early times for the sizing of paper, and subsequently glue. Rosin size, invented at the beginning of the last century, or rosin soap, as it was termed, was prepared by dissolving rosin in a double-jacketed pan heated by steam. The two descriptions of brown or neutral precipitated size, and white or satin rosin size, having been referred to, the lecturer described



St. Raymond Co.—A Power yet to be Harnessed.

SIZING AND COLORING OF PAPER.

In a series of lectures before the Society of Arts, in London, Julius Hubner, dealing with paper manufacturing processes, said that, although the bleach was removed by the washing process, in many instances it was not carried far enough, and disintegration was resorted to by a so-called antichlor. The quantity of antichlor should never exceed the amount required for the decomposition of the bleach. Dealing with the sizing of the pulp, he said that paper made from fibres in a pure state, at present would not resist water, the pores

the modern method of preparing rosin size in specially constructed vessels under high pressure. Other sizing agents rarely used were mentioned, including viscose, which gave a slight discoloration to the paper sized with it. Casein, obtained from milk, was an excellent agent, but costly.

The next process that came under notice was the loading of papers. One of the objects of the loading materials was cheapness of production. In many instances, however, the addition of loading materials was for other reasons indispensable, its use in producing uniformity of shade in the pulp, its liability

of making the paper less transparent, and its adaptability to the requirements of printing being pointed out. China clay (kaolin), was the loading material most commonly used, on account of its insolubility in water, though it was rather costly. Starch frequently used to go with rosin size, but it might be counted among the leading materials. Although costly, its use for high class papers could not be dispensed with.

As to the dyeing of pulp, the lecturer divided the coloring matter into two groups, subjective and objective, and after specially mentioning the value of tannic acid as a mordant, he gave a short review of the principal coloring matters used, dividing them into inorganic and organic colors, the latter being subdivided into natural colors, such as vegetable and animal, and artificial coloring matters, usually called coal tar colors. The process of the tinting of papers was briefly referred to, and then the conversion of the pulp into paper was described, a series of slides elucidating the methods employed for procuring the flow of pulp from beater to stuff chest, its regulation, and its freeing from other impurities by being passed through automatic cleansing strainers, the flat and revolving types being described.

In explaining the hand process of paper-making, the lecturer produced a paper mould which had been lent by Christie & Co., of Edinburgh, and on which was a water mark consisting of the words: "Society of Arts Cantor Lectures," and he demonstrated the various processes. As far as artistic paper making went, the lecturer thought the Russians were a long way ahead, and next to them came the Italians. Attempts had been made in Berlin to imitate the beautiful Russian water marks, but they had not yet been able to produce them exactly the same. It took an artist from nine to thirteen months to produce a model in wax from one of those water marks. Examples were exhibited of Russian water marks, the designs being portraits of Christ, the Madonna,

the Czarina and the Czar, and the late President Faure, which were all greatly admired by those present at the close of the lecture. A specimen of one of the Berlin water marks was also on view, which the lecturer considered not as fine as the Russian, but it came very near to it. The unfortunate part of it was, he added, it was not possible to buy one of those Russian moulds with money or anything else. He had tried very hard to get possession of one.

The tub sizing of hand-made paper then came under view. With the aid of further diagrams thrown on the screen, the lecturer followed the pulp on its journey through a Fourdrinier paper making machine, explaining the function of the deckle straps, the peculiar shaking motion on the machine in imitation of the hand paper maker, and the collection of the back wash fibre catchers or "save alls," as they were called. The treatment of the back water was of great importance, not only from an economical point of view, but river pollution could be avoided by suitable arrangements for the filtration of the back water from paper mills. Water marking by means of a cylinder on the paper-making machine was explained, the "Dandy Roll" being introduced in 1827.



CANADA PAPER CO.'S CONVENTION.

The idea of annual conventions of heads of departments, travellers, and other employees of manufacturing establishments, is a development of modern industrialism. It has been successfully inaugurated in many places in the United States, and the practice is now being adopted here and there in Canada. The first to inaugurate it in the paper trade is the Canada Paper Co., which has just had a successful three days' convention of its heads of departments, at Windsor Mills, when advantage was taken of the occasion to inspect the new St. Francis mill, which was illustrated in last issue. There were present from Montreal, W. Cauldwell, manager of the Montreal warehouse; Messrs. Winn, Vale, Savard,

Robertson and King. From Toronto, H. B. Donovan, manager of the Toronto warehouse, with Messrs. Thorne, Taylor, Marshall, Jennings, and Tove. Of the head office at Windsor Mills the representative men were F. Powell, business manager; W. H. Parsons, secretary-treasurer; Messrs. De Cew, Briggs, Sykes, Burns, Bastedo and others. Among the subjects discussed were efficiency of service for the company's clientage, improved methods of packing, and how to secure uniformity of colors. The question of an export market was also considered.

THE KNOPF WASTE PAPER PROCESS.

This is a process for treating waste papers, especially printed papers, so that clean pulp can be made therefrom. Heretofore, it has been the practice to break up the paper, and beat it in a wet condition, at the same time treat it with various chemicals for the purpose of dissolving the ink. In such attempts, however, difficulties have been experienced in the practical working of the cleansing operation.

According to the present invention, the paper is firstly sorted according to



H. Montagu Allan, President.



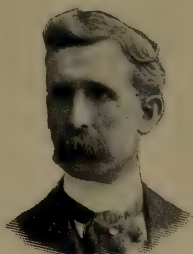
John MacFarlane, late Managing Director, and a present Director.



F. J. Campbell, Gen'l Manager



H. B. Donovan,
Manager Toronto Office.



Wm. Cauldwell,
Manager Montreal Office.



W. H. Parsons, Sec.-Treas.

OFFICERS OF THE CANADA PAPER COMPANY.

A neat booklet, just issued by the company, refers, as follows, to the new extensions: "We are spending on new buildings alone over \$250,000, and have placed an order for a paper-making machine that will surpass in width by 30 per cent. any now in use in this country, in fact, this machine, which will be 156 inches wide, is within a few inches of the widest machine ever built. This will give us a total output of sixty tons of paper and fifty tons of pulp per day, every pound of which is needed for our continuously increasing trade."

its different varieties or qualities. The paper to be treated is then subjected to a tearing or beating operation, by which it is separated into small pieces, and preferably the paper is so treated when it is in a moist condition, or in some cases it might be so treated when dry. A kneading or beating machine of any suitable construction is then employed, into which the paper waste is transferred by travelling aprons, inclined shoots, or any similar contrivance, and in that kneading machine the pieces of paper are further reduced in size and separ-

PAPER MILL ECONOMIES.

ated, but the fibres which compose the paper are not entirely divided. The paper waste is then placed in a washer along with a soapy solution, the soapy water being just warm, the object being to dissolve the ink and separate the fibres, care being taken that the latter are not broken. The soap employed during this part of the process may be manufactured near the place of treatment, and is composed of cheap, raw materials such as olein or Japan fish oil, and soda, the composition being approximately water, combined alkali, free alkali, and fatty acids, and is soft or fluid mainly on account of the nature of the fatty acids. The ink being thus dissolved and the fibres in a separated condition, the said fibres are then fed onto a travelling wire gauze, where they are subjected to a suction drainage, which is applied with sudden force and it may be so applied once or several times. This suction drainage may be effected by passing the fibres to be treated upon wire gauze, above any suitable construction of air exhaust apparatus. This suction has the effect of drawing off the ink mixed with the soapy water, which ink but for this sudden suction would mostly have remained in the pulp. The paper matter having been so treated is then again kneaded in suitable kneading machinery, and then washed or rinsed by a washing machine, in a solution containing less soap, being afterwards drained upon wire gauze. The matter is again washed a third time with clean water, after which the pulp is fed to a paper machine. The soap employed in the process can be separated from the waste waters and re-used time after time, and this separation is conveniently effected by allowing the waste fluid to settle and then filtering the same.



For some time past peeled poplar from the Ottawa and Gatineau districts has been in increasing demand from United States mills for pulp purposes, most of it going to mills in New York State.

A writer in "Paper Making," of London, gives advice on the economical management of paper mills using steam power. In recommending the use of steam pipe covering, he says a 2-in. wrought iron pipe, 10 ft. long, will waste, when bare, \$5.25 a year with coal at \$2.50 a ton, allowing 8 lbs. of water evaporated per lb. of coal, and running at 130 hours per week. A 10-ft. length of 4-in. pipe will waste \$11.75. About three-quarters of this waste can be saved by a good non-conducting covering, of which the writer thinks mica is the best.

The presence of oil in the economizers and boilers is a frequent source of loss of coal, if nothing worse results. A very thin coating of oil on a boiler-plate is enough to get it overheated, and there is no knowing what may be the results of such overheating. The water from condensing engines must of necessity contain oil unless some measure is used to extract it.

There are now several makes of oil separators which can be applied between the cylinder and condenser. The makers will generally guarantee that 98 per cent. or so of the oil can be removed. If the oil cannot be removed this way, and there is any quantity of it getting into the economizers or boilers, then the feed-water should be pumped through an oil filter previous to going into the economizers. In fact, this is nearly always the best and easiest way to arrange it, but like most things in paper mills, the oil filter wants attention, and must be cleaned out and emptied every few weeks, and then good results will be obtained from it. Oil accounts for another frequent source of loss, and that is in the paper machine drying cylinders, when the exhaust steam from the steam engine is used for drying the paper, which should always be the case.

Oil is a very bad conductor of heat; therefore, when the drying cylinders are coated inside with a film of oil the heat of the steam inside the cylinder cannot pass so readily to the outside of the

cylinder; the result is it takes much more steam than it would do were the cylinders clean inside. Not only does it cause waste of steam, but it is a frequent source of unevenly dried or cockly paper; it often means, too, that you cannot run the machine as fast as you might do could you dry the paper better. To get over this trouble some mills put soda ash in the steam pipe to the cylinders to dissolve the oil. This causes great trouble with all the joints, as the soda ash affects the packing material, and it is not to be recommended. The best way of reducing the difficulty is to have an oil separator on the steam engine exhaust pipe before the pipe leads to the cylinders; you can then extract about 98 per cent. of the oil used in the steam engine cylinder. Not only will this save steam directly on the paper machine, but if the condensed water from the dryers is led to the hot well, which should invariably be done, the water will have no oil in it, and will be a purer feed for the boilers.

If possible have indicating gear fixed to every steam engine, small and great. It is almost impossible to indicate the engines too often. Many mills neglect this, with the result that they often have breakdowns and stoppages which might have been avoided, and also coal wasted that might have been saved. The indicator is almost always a sure tell-tale of anything wrong.



FOREIGN MATTER IN PAPER.

(From a paper by Dr. Klemm, in *Wochenblatt für Papierfabrikation*).

Substances, unintentionally contained in paper, properly called matter out of place, whose chemical resistance I wish to examine, are in part soluble in water and partly in other dissolving means, acids, alkalis, ether, and alcohol. Let us try to get acquainted with these bodies, in order to distinguish those to be considered as harmless and those that may be harmful under certain circumstances, and others threatening the existence of paper under all circumstances:

In case we extract a paper with distilled water without heat, we obtain as a rule after evaporation of the water, a residuum of a yellowish or brownish shade, and that even from pure white papers and from unsized paper. Heating the residuum in a transparent glass vessel, we may notice the following characteristic appearance. The centre shows a glassy, more or less turbid spot, from a yellow to a brownish shade. Sometimes, however, the surface glitters in the colors of the rainbow; while the upper rim shows a white substance, consisting of diminutive crystals, observable under the microscope. The quantity of these bodies, soluble in unwarmed water, may amount to only small traces, yet these may increase to such an extent that we could extract a weighable substance in cold water from only a few grammes of paper.

In sized papers this extract may exceed half of 1 per cent. and in boiled distilled water it is essentially higher, representing 38 per cent. in a normal sheet when the cold water extract would only show 24 per cent. Collecting and heating the residuum in a porcelain or platinum shell, the substance turns black and leaves ashes after a red heat. Consequently the remainder contains organic and also mineral matter.

The question presents itself: What is the nature of these organic and inorganic substances? How do they react separately and mutually? Do they contain bodies that may influence the chemical resistance of paper? Among the organic bodies soluble in water we find some whose presence is generally known, and their influence has often been mentioned, such as excesses of aluminum sulphates, chlorine salts, especially sodium chloride and calcium chloride, eventually also aluminum chloride. As a rule, we find sodium sulphate and sulphate of lime are seldom missing, and free sulphuric acid is not excluded. A part of these organic bodies, soluble in water, derive their origin from the mill water, although they generally consist of salts that have been applied for manufacturing purposes, and of bodies formed by reaction of applie^d

chemical matter. Consequently their quantity and character show a difference, according to the care taken during the making of the paper, and according to the nature of the latter. Much depends upon the sizing, or the absence of it, and the bleached or unbleached material.

Organic matter, soluble in water, as found in the water extract, has been but little examined. Starting with the visible material we frequently observe coloring matter; hydrates of carbon are frequently occupying an important part; sometimes we can trace starch, as shown in the blue color of the residue, or by means of the iodine test. Still other carbon hydrates are present, characterized by their quality, to reduce copper oxydide from Fehling's solution. Consequently we prove the presence of dextrine or glucose. Adding alcohol to a solution of the evaporated extract the presence of dextrine is shown in a flaky precipitate. Yet there may be some glucose, which is precipitable by larger quantities of alcohol in a concentrated solution.

These substances may be derived from bleached rag stock, or from starch contained in the same, or the starch may have been added during the sizing process. Probably the hydrolizing of carbon hydrates causes the formation of dextrine and sugar, and this process may be continued during the warming of the wet stuff, while it runs over the paper machine. My own experience leads me to ascribe to the dextrine the principal part of the organic bodies soluble in water, as even then, where there exists neither glue nor starch, a precipitate with tannic acid will produce flakes, and the latter may be still increased by a careful addition of muriatic acid.

It is remarkable that bodies soluble in alcohol may be present in the water extract, especially when the same is heated, and even after filtration of the matter. These bodies seem to consist of saponified fat and resin, and are found in the evaporated solution of the evaporated extract. In case papers are sized with glue, the latter will be found in the hot water extract. As regards the action of all these bodies, those possessing the quality of

attracting water will impart that quality to the paper, and in this respect the chlorides are of special consequence. A high grade of humidity is a first-class condition for further injury, especially as to the matter of weak resistance, and possibly not excluding the fibres themselves.

Before looking into this subject we must examine the matter out of place, so far not mentioned. Besides the soluble substances, others are unintentionally present, which are insoluble in water, and many of them are soluble in acids or in alkalies; others in ether and alcohol. In this line we need not consider the bodies forming the ashes, though some may be of organic and some of unorganic origin.

The lime salts, frequently in company with magnesium salts, deserve first mention; especially carbonate of lime, desirable and precipitable from hard water, or from the boiled lye, in case caustic soda has been used, and also from bleaching solutions. Sulphate of lime may be found in the lime precipitates as lime salt, in case the bleaching process has been started with sulphuric acid, and when lime salts are forming by transformation of alum in water containing lime. Sulphite fibre frequently furnishes some calcium monosulphite. We also find lime salts coming from fatty matter and eventually from rosin size.

The combinations of lime and fat insoluble in cold water, appear especially in rag fibres; fatty matter derived from raw rags will leave traces after saponification with lime, because they are not readily washable in cold water, and frequently they leave traces after being washed in hot water.

Rosin lime salt is formed in hard water, or in the lime salts left in the stuff after bleaching. It happens that considerable parts of the rosin in paper appear in combination with lime. Furthermore, we find aluminum combinations insoluble in water in sized papers—especially basic sulphite of aluminum, created in various quantities, according to the percentage of alkalies present during the precipitation process, also in

resinates of aluminum salts, arising from the same cause. These rosin and aluminum salts play an important part in the chemical resistance of paper against inks, in the sizing quality.

Finally, we remember the combination of rosin, fat, and iron, the importance of which we have learned to comprehend, and also, the presence of finely divided sulphur in sulphite papers. It appears to be plain that these substances being soluble in water, may remain inert during possible changes, and exert no direct effect on matter which is purposely present in paper; nevertheless, they may be of great consequence regarding the chemical resistance of paper; and so they are.



GOOD WORDS.

Une publication très utile et que nous recommandons fortement à tous ceux qui s'intéressent aux développements de l'industrie de la pulpe et du papier en Canada, vient de voir le jour: C'est une brochure d'informations à la fois techniques et de commerce en matière de pulpe, qui rendra de très grands services surtout dans notre province, et à laquelle nous souhaitons tout l'encouragement possible. Elle est intitulée: "Pulp and Paper Magazine," et est publiée chaque mois à Toronto, par la maison Biggar-Samuel, 18 rue Court. L'abonnement n'en est que de \$1 par an. Le premier no, celui de mai, est magnifique comme renseignements.—Moniteur du Commerce, Montreal.

It is estimated that Canada will in 1903, supply twenty-five per cent. of the requirements of the British pulp market and in addition to these exports, the paper and pulp mills of Canada now supply the home market to a greater extent than ever before. These are the facts quoted to support the view that there is a field for a pulp and paper trade journal, a view that is certainly justified when the large interests concerned are considered. The appearance of the new Pulp and Paper Magazine of Canada, of which the first copy has been

sent to us, will, therefore, be welcomed.—Witness, Montreal.

We note the appearance of a new monthly, entitled the Pulp and Paper Magazine of Canada. The publication is demi-octavo size, 32 pages reading matter and 20 pages advertisements, and containing articles on the British Paper Industry, and its Relation to Canadian Trade; Fibres for Paper-making; Canada and Her Forest Assets; the Sault Pulp Mills, and the Pulp Industry in Quebec, besides some pages of notes and of market reports. It is an intelligently edited journal, clearly printed, and it appears to have, in the pulp and paper business, a field for usefulness and growth.—Monetary Times, Toronto.

The publishers regard this magazine as a trade necessity, because Canada is destined to be the greatest pulp and paper manufacturing country in the world, having the largest supply of spruce, and the finest water powers to be utilized in the conversion of the wood into pulp and paper. The first number contains diagrams of the sulphite pulp mill at Sault Ste. Marie, and a picture of the Canada Paper Company's new St. Francis mill, besides many interesting articles on the conditions of the trade in Europe and America.—Hamilton Times.

The first number of a new and interesting publication called "The Pulp and Paper Magazine," makes its appearance this month. The May number contains, among other features, a plan in longitudinal section of the Sault Ste. Marie Pulp and Paper Company's sulphite pulp mill, articles on "Canada and Her Forest Assets," and "The British Paper Industry and its Relation to Canadian Trade." It discusses also the latest approved methods of paper manufacturing and pulp and paper machinery.—Halifax Chronicle.

We received the first number of the Pulp and Paper Magazine this a.m., and are much pleased with its appearance.—Jenckes Machine Co., Sherbrooke.

Very nicely gotten-up, and we welcome it with pleasure. We certainly think

that this paper will be of the right kind and will be of help to us who are in the trade of pulp and paper machinery.—Carrier, Laine & Co., Levis, Que.

I have just received No. 1 of volume 1, of the Pulp and Paper Magazine, and congratulate you, not only upon its appearance, but upon the subject matter as well. There seems to be a conservative vein running through it which I regard as a most important feature in any trade paper. It should be just as much the province of such a paper to point out the dangers which confront capital in any industry as it is to exploit opportunities for it. It will greatly injure the industry if its trade paper allows itself to be made the mouthpiece of irresponsible promoters, whose object is merely to project some enterprise whereby in the process of creating it, they may get a portion of the investor's money without regard to what finally becomes of the enterprise.

If in your editorials you advocate caution and conservatism, you will make your paper an element of strength in the paper and pulp industry, and will, I believe, secure the success you will merit.—Hugh J. Chisholm, President, International Paper Co., New York.

We have received a copy of the magazine, and find its contents very interesting, indeed.—The Pusey & Jones Co., Wilmington, Del.

The Pulp and Paper Magazine of Canada is a monthly publication, devoted to the interest of Canadian pulp and paper manufacturers. It cites the fact that it was only in 1890 that the exports of pulp and pulp-wood from Canada were considered of sufficient importance to give them a separate classification in the Dominion Trade and Navigation Returns, since which time these exports have steadily risen, which fact, we are told, justifies the publication of the magazine. It is printed on good paper and is a creditable specimen of book work.—Canadian Manufacturer.

The first number for May of the Pulp and Paper Magazine of Canada, is what its name denotes, a voice in the interests

of the Canadian pulp paper trade. It contains some eighteen articles, most of them briefly written, in thirty-two pages, with nearly as many pages of neatly arranged advertisements. A sketch of the pulp mills at Sault Ste. Marie, with a map explanatory, is highly interesting. "Canada and Her Forest Assets" is the title of an article, by Mr. George Johnson, F.R.S.S., Dominion statistician, in which he says that "In our forest wealth we have more than in any other of our natural resources, a force whose potency for good cannot be overestimated. This he elaborates, showing where Canada can reap the reward of her riches by supplying the United States and Britain.—Witness, Montreal.

The initial number contains a batch of interesting matter. The issue has articles dealing with these subjects: "British Paper Industry and Canadian Trade," "Fibres for Paper Making," "Canada and Her Forest Assets," "Pulp Mills at the Sault," "Quebec Pulpwood Association," "Anglo-Canadian Pulp Trade," "Is the Paper Industry Over-developed?" "Scandinavian Trade," "The Industry in Quebec," "Mr. Monk on the Pulpwood Question," "Great Britain and the United States in the Canadian Paper Market."—Gazette, Montreal.

We received copy of "Pulp and Paper Magazine." The issue we think is very creditable and we trust you will make it a distinct success.—Champion-International Company, St. Lawrence, Mass.

Mill Matters

The grinders and other machinery are being installed in J. R. Booth's new pulp mill at the Chaudiere, Ottawa.

Ritchie & Ramsay, manufacturers of coated papers, have put a new 200-h.p. engine and boiler in their works at New Toronto.

The Trois Pistoles Pulp & Paper Co., with headquarters at Montreal, and with a capital of \$150,000, has been incorporated by Christopher Israel Gagnier, of Springfield, Mass., and others.

S. E. Pettee, inventor of the machine for making paper bags, died at Cleveland, O., this month, aged 81 years. He was a native of Foxboro, Mass., where he was taken to be buried.

The workmen at the Lincoln Paper Mills, Merritton, and the Kinleith Paper Mills, St. Catharines, have been relieved of Sunday work by amicable arrangement with the proprietors.

At the annual meeting, on the 1st inst., of the Watson-Foster Company Limited, wall paper manufacturers, Montreal, the following officers were elected: Hugh Watson, president; S. S. Boxer, vice-president and general manager; W. A. Sutherland, secretary-treas.; R. Fraser, superintendent.

The timber limits of the Ouitchouan River Pulp Company, near Roberval, are reported to have been damaged to the extent of over \$50,000, by the forest fires of May and June. A million feet of pulp logs, owned by the St. John Sulphite Co., which had just been landed at Mispic, N.B., were saved only by the greatest exertion.

The surveyors who recently went over the route of the proposed Trans-Canada Railway confirm the reports of travellers as to the quantities of pulpwood and other timber in large areas, and also as to the number of water-powers here and there in the regions of Northern Ontario and Quebec, lying beyond the "height of land."

John Christie, manufacturers' agent in pulp and paper mill supplies, reports brisk business in his line. Mr. Christie is agent for the James MacLaren Pulp Co., of Buckingham, Que., the St. John, N.B., Sulphite Pulp Co., and the Penobscot Chemical Fibre Co., of Great Works, Maine.

A Canadian and United States patent has been granted to Joseph S. Hughes, of Chesley's Corner, N.S., for his invention for converting fluid pulp into semi-dry cakes or sheets, which are more suitable for storing or shipping. It is likely that a company will be formed to

handle the new invention, as the inventor has received orders for its application to some pulp mills.

The New Brunswick pulp men are joining the Quebec and United States interests in opposing the extra duty, the appeal against which is being argued in New York.

The Royal Paper Mills Co. are now at work rebuilding the saw-mill and pulp-mill at East Angus, recently destroyed by fire. It is expected the mill, which will have a capacity of 25 tons of soda pulp per day, will be running in August.

It is reported from St. John, N.B., that a syndicate of United States men, headed by J. M. Hastings and M. J. Tinfet, of Pittsburg, has purchased the mills of E. D. Davison & Co., of La Have River, Lunenburg, N.S., and the timber area attached. The amount paid is said to have been \$1,250,000. The new owners propose to go into pulp making and paper making, the mills to be located at Bracebridge, N.S.

At the assizes recently held at L'Original, before Sir Wm. Meredith, Mrs. Georgiana Leduc, of Hawkesbury, brought action against the Riordan Paper Mills, of the same village, to recover damages for the death of her son, Ovila, on February 10th, 1903. The young man was killed by the falling of a defective smoke flue in the boiler room of the mill. Judgment was entered for the plaintiff by consent, for \$900 and costs. Robert Robertson, a resident of Cornwall, and who was seriously injured in the same accident, also sued for damages against the mill, and recovered by consent, \$500 and costs.

It is proposed to build a spur of the New York & Ontario Railway from Loon Lake, on the Delaware & Hudson, to a point near St. Regis Falls, on the New York & Ontario, a distance of 21 miles, to run through lands owned by W. Rockefeller, of the Standard Oil Company. This would give the Delaware & Hudson the shortest line between Albany and Ottawa, with its im-

mense lumber and pulp-wood market. Recent additions to Mr. Rockefeller's already immense holdings of Adirondack lands have made him, it is said, the largest individual holder of Adirondack timber lands. This railway would enable him to market immense quantities of pulpwood, which he is anxious to do, leaving the hard wood standing.

The Sturgeon Falls Pulp & Paper Co. has been given the right to sell out to the Imperial Paper Co. When the concession was granted to the former, they were bound not to sell till the completion of their works, but the right has now been granted by the Ontario Legislature.

Some months ago a proposition was made by Louis Simpson, formerly manager of the Montreal Cotton Co., to form a company to utilize the Chats Rapids of the Ottawa for a cotton mill and a pulp mill. English and United States capital was to be interested, but nothing further has been heard of the scheme lately.

The employees in the finishing rooms in all the coarse paper mills, at Holyoke, Mass., struck June 8th, because of dissatisfaction with the schedule presented by the American Writing Paper Company. About 400 hands went out, and it is feared the strike will spread. International President Mackey, of the Paper Makers' Union, was telegraphed for to his home in Watertown, N.Y.

It is expected that the new pulp mills of the Chicoutimi Pulp Co. will be ready for operation in August. There will be a formal opening at which it is understood some English capitalists interested in pulp mills will be present. The new mills contain twenty grinders, capable of turning out 100 tons a day. Hon. P. Garneau, of Quebec, is president, and J. E. A. Dubuc, general manager of these mills.

Pulp & Paper, of London, says: The question of the determination of moisture in wet woodpulp is a matter which has occupied the attention of everyone in any way connected with this material. This much vexed question has been the

cause of innumerable disputes, and the subject of careful investigation on the part of many trade experts. The Canadian industry has naturally not escaped the trouble, and there have been many differences between producing mills and their customers. We learn with interest that the Chicoutimi Co. have engaged G. Davis, of the well-known firm of Davis Bros., of Manchester, to go out to its mills and thoroughly investigate the arrangements for the determination of moisture, with a view of putting them on a reliable working basis.

The Union Screen Plate Co., of Fitchburg, Mass., has now got its new Canadian branch in working order at Sherbrooke, Que. These new works, which are furnished with electric power and light, will make for the Canadian mills its specialties in "Union bronze" and rolled brass screen plates. Adams Crocker is president and general manager of the company, and H. W. S. Downs is superintendent of the Canadian branch.

T. Pringle & Son, the well known firm of hydraulic, electrical and general mill engineers, of Montreal, are now making a specialty of pulp and paper mill engineering. Owing to their connection with the development of important water powers, in various parts of Canada, they have deemed it important, to both their clients and themselves, to make a specialty of paper mill work in conjunction with their engineering business. They have organized a pulp and paper mill engineering department and have associated with them H. G. Turner, who has charge of this department. Mr. Turner has been for several years engaged in the building of paper mills, and was with Tower & Wallace for four years on various important paper mill work. While with Tower & Wallace, Mr. Turner held the important position of resident engineer throughout the entire construction of the most modern and extensive pulp and paper mills of the Oxford Paper Co., at Rumford Falls, Me. T. Pringle & Son are amply pre-

pared to make complete detailed plans and specifications of ground wood mills, sulphite and soda fibre mills, and paper mills. The fact that the various branches of engineering done by this firm have competent engineers in charge of their various engineering departments, puts them in a position to design large paper and pulp mills, and have all hydraulic, electrical and mechanical developments throughout the entire plant, carried out on modern lines.

Argument has just been heard by the Court of Appeal of Ontario, in the case of Glasco against the Toronto Paper Manufacturing Co. The original action was tried before Justice Britton, without a jury, in which the plaintiff was awarded \$2,500 damages for injuries sustained in defendants' mill, at Cornwall, where he was employed, cutting and trimming paper with a paper-cutting machine, and while so engaged lost his right hand and portions of the fingers of the left hand. Plaintiff alleges that the machine had been in a defective condition a long time prior to the accident. Defendants contend that the injury was caused by reason of contributory negligence on the part of plaintiff. From the verdict defendants appealed. Judgment in the appeal has been reserved.

At one point the Shawinigan river and the St. Maurice, in Quebec, come within 1,000 feet of each other, but with a difference of level of 150 feet, and it was here on a point on the upper bay that the Shawinigan Water & Power Company carried out one of its two power developments. This second installation was built by the Belgo-Canadian Pulp Company, whose large pulp mill is supplied with water by the Shawinigan Company. The Belgo-Canadian pulp mill turns out 10 tons of pulp per day, using for this work 8,000-h.p., while an additional 7,000-h.p., making 15,000-h.p., will soon be used by another paper and sulphite mill. The pulp mill is located on the lower ground, the headworks having been constructed on the north side of the upper bay, and the water taken down through a narrow bank to the mill

located on the Shawinigan river. It is intended to extend the works for other mills along to the west, and other factories which will locate further up the river. A few miles above these works are the big pulp and paper mills of the Laurentide Pulp Co. at Grand Mere.

Among the companies recently incorporated to develop the pulp industries of Canada, is the Magdalen Islands Co., which obtained its charter from the Government of Quebec. It is composed of W. F. V. Atkinson, Geo. E. A. Jones, C. W. A. Walcot, of Quebec; Wm. G. Tait, of Pictou, and H. W. Racey, of Johnsville. The capital is \$100,000, and the head office at Quebec.

The annual report of the Commissioner of Crown Lands of Ontario, issued last month, shows that the pulpwood taken out from Crown lands in the last calendar year was 29,703 cords, most of which come from western districts. The report makes the following reference to various pulp mill operations during the year: "The Sault Ste. Marie Pulp and Paper Mills have taken out large quantities of pulpwood, and the mills have been in operation almost continuously during the year. The Spanish River Pulp Company has its mill well under way, and is taking out a stock of pulpwood this winter. The Sturgeon Falls Pulp Company, having settled all its litigation, is proceeding with the erection of new mills, and is also taking out a large stock of pulpwood. The Nepigon Pulp Company is preparing for the erection of its mills by taking out timber, The Keewatin Pulp Company has not felt able to proceed with its developments. The Montreal River Pulp Company has not yet commenced the erection of its mills, though it is understood to be preparing to do so. The Blanche River Pulp Company has not felt warranted in going on; the settlement of the Blanche River has proceeded so rapidly that the territory covered by its concession has passed into the possession of settlers, who own and control the timber. (The company is being wound up, as reported last month). The only

concession granted during the year has been to the Rainy River Pulp and Paper Company. This company is composed of representative men, and proposes to start development immediately."

The Victoria, B.C., Colonist emphasizes the advantage it would be to Canada if all the pulpwood cut in the country was also manufactured therein, and suggests a high export duty, at any rate, until the United States sees fit to lower the duty on paper entered from Canada. It also points out the desirability of a reform in the methods of cutting pulpwood. Usually contracts are let to jobbers, who are assigned an unnecessarily large territory. Their object is to obtain logs at the cheapest rate, and in order to do so they cut only the best trees, leaving the fair to middling for future contractors. The jobber is also content to procure from each tree only a certain number of logs of the called-for length, leaving good wood to rot because slightly below specified size. Some of the manufacturers find themselves constrained to cut the logs themselves, though it is a more expensive system at first; but it may be cheaper in the end, and will certainly be more exhaustive and scientific. The Colonist further calls attention to the damage which is being done to spruce forests by beetles and other insects. T. B. Speight, who is surveying townships in New Ontario, calls attention to the same fact. Here is something for our entomologists to work on.

Wm. Barber & Bros. have installed a new electric lighting and power plant in their paper mills at Georgetown, Ont., replacing the old one. The new plant consists of a 100 kilowatt generator and a 100-h.p. motor, from the Bullock Electric Mfg. Co. The power is transmitted from the lower Georgetown Falls, nearly a mile distant. John R. Barber, M.P.P., the head of these mills, is not only a successful paper manufacturer, but is a mechanical genius, having devised several clever contrivances. Among these was a very simple method of heat economizing for steam boilers, using

chimneys. This was described some time ago in the Canadian Engineer, and the device has been adopted by a number of mills, Mr. Barber not having patented the idea. As a matter of electrical history it is interesting to recall the fact that Mr. Barber installed the first electrical transmission plant in existence. This is the old plant just discarded, and consisted of a 100-h.p. generator and a 60-h.p. motor, made by the Brush Co., of Cleveland. It was installed at the Georgetown Paper Mills in September, 1888, and ran 142 hours per week, for a period of 13 years, without accident or interruption, a record which has probably not been equalled in point of continuous work by any of the more modern plants since installed elsewhere.

The deal in pulpwood areas in Newfoundland, referred to in last issue, seems to be taking shape for active operations. The Newfoundland Timber Estates, Limited, of which H. J. Crane, of Halifax, is president, and H. M. Whitney, Boston; Hon. W. S. Fielding, B. F. Pearson (Dominion Iron & Steel Co.), and W. D. Reid, of Montreal and St. John's, are directors, are arranging for an experimental pulp mill, at Gumbo, and if that is successful, other large mills will be built at Indian Bay and at Grandin river. The Newfoundland Timber Estates have acquired in part or in whole, areas amounting to 1,000,000 acres owned by Sir Lewis Miller, of Scotland, and lying along the Exploits River, Indian Lake, Lloyd's River, Victoria River, and King George's Lake; and upon some of this property the Harmsworths have an option. It is said that at Grand Falls, on the Exploits River, where there is a fall of 85 ft., the Harmsworths will build a ground pulp mill, a sulphite mill, and a paper mill, on a big scale. The company of which Mr. Crane is head, is credited with the design of adopting modern forestry methods in cutting logs by restricting themselves to trees of full growth, and giving the young trees a chance to grow, so that a regular annual harvest can be gathered without destroying the forest. Special precautions will be taken against fire.

The James Maclaren Co., of Buckingham, Que., are reported to be contemplating the establishment of paper mills in connection with their pulp mills.

Industrial Canada corrects an error in its May issue, in which it was stated that the first coated paper made in Canada was produced in Montreal about the year 1886, by the Canada Paper Company. As a matter of fact, coated paper was first made by G. J. Gebhardt & Co., whose business was acquired by the Burland Litho. Co., in 1882, this finally becoming the Union Card and Paper Company, of Montreal.



PERSONAL.

M. P. Shea, late purchasing agent for the Laurentide Pulp Co., of Grand Mere, has joined the staff of the Fairbanks Co., of Montreal.



UNITED STATES PAPER TRADE IN 1902.

In tracing the growth of United States exports of paper by decennial periods, it is found that paper began to appear in the list of exports of manufactures in 1830, amounting to \$41,000 in that year, and that it had reached a quarter of a million dollars by 1860, a million dollars in 1880 and 1890, but by 1900 had reached six millions, and in 1902 was nearly seven and a half millions.

These exports of paper and manufactures of paper during 1902 were distributed as follows: Europe took from us all classes of paper and manufactures of paper to the value of \$2,217,716. To various countries of North America we exported paper and paper manufactures to the value of \$2,316,674, a trifle more than our exports to European countries. To South America we exported \$432,167 worth. To Asia we shipped only \$267,381 worth. To Oceania our exports of paper and manufactures of paper reached the sum of \$2,028,541. We shipped to Africa only \$49,551 worth. The grand total of these exports for the year 1902 amounted to \$7,312,030.

The United Kingdom and its dependent territory are by far the largest consumers of paper manufactures of the United States. Of the total exports as given above, the United Kingdom took \$1,832,008 worth, while British Australia received such exports to the value of \$1,740,305, although these totals are neither of them so great as the value of such exports during the year 1901. Our exports to Quebec, Ontario, etc., amounted to \$1,306,699, as against \$1,205,698 worth during 1901. Japan, which is also another of our largest single customers, last year took only \$187,860 worth, as compared with \$206,586 worth during 1901. Exports to Cuba, another good customer for our paper, fell off somewhat last year, amounting to \$233,125, as compared with \$240,004 for the previous year.

The following statistics show the imports of paper and manufactures of paper of the principal countries of the world in 1901, the latest available year: Austria-Hungary in 1901 imported paper and manufactures of paper to the value of \$5,491,000. Belgium took \$4,254,000 worth of foreign made paper. Denmark imported \$2,400,000 worth, while France received \$8,774,000 worth. Germany imported \$27,694,000 and Italy \$2,085,000, while the Netherlands received such importations to the value of \$4,238,000. Portugal imported paper and manufactures of paper to the value of \$748,000 in 1901, while her neighbor, Spain, received such imports to the amount of \$1,325,000.

Russia (European frontier) imported during 1901 paper and manufactures of paper to the value of \$33,475,000 and exported only \$268,000; Sweden imported \$1,674,000 and exported \$4,570,000, and Norway imported \$1,511,000 and exported \$2,860,000 worth. Switzerland took of such imports \$3,967,000 worth. Imports into the United Kingdom along this line amounted to \$22,082,000. Canada took \$3,612,000; Mexico \$2,079,000; Argentina, \$2,468,000; Brazil, \$2,094,000; Japan, \$1,825,000; India, \$3,202,000; Australia, \$6,291,000.

In 1900, the latest year available for

the following countries, paper imports are noted as follows: New South Wales, \$2,617,000; Victoria, \$2,342,000; Queensland, \$437,000; Western Australia, \$259,000; South Australia, \$484,000; Tasmania, \$152,000; New Zealand, \$1,589,000.

C. D., In The Paper Mill.



OTHER WOODS THAN OURS.

A writer in the Paper Trade Review, commenting on the diminishing quantity of the world's supply of spruce, wonders if Australia or some other colony cannot discover a substitute for spruce in some of the unexplored forests. His speculations are, however, not very conclusive. He says: "In the production of that now indispensable raw material (wood pulp) spruce, as is well known, is the favorite, and hitherto the most successful, but not exclusively the only, timber suitable for reduction into pulp. At the same time the paper-making world is faced with the difficulty that, except in Canada, the world's resources in spruce are becoming seriously diminished; and many there are who are looking anxiously for some other wood capable of being fairly placed alongside of it in the estimation of the pulp maker and the paper manufacturer. The subject, indeed, is one which is receiving anxious attention in Canada, the United States, and in some other pulp producing countries. The results should certainly be interesting, but, unfortunately, the progress made is very slow, and not, so far, encouraging. Spruce has established itself in such high favor as a pulp making material that the out and out wood pulp maker will hardly hear of any other wood being at all suitable. At the same time, the progress of invention has made it clearly evident that there are other woods adapted for pulp making, some of which are quite as good as, if not even better than, spruce. The fact of the case is that already a certain proportion of the wood used in the pulp mills of the United States and Canada is other than spruce. For the finest paper a blend of other woods is commonly used with spruce. Hemlock

is also extensively used, and poplar and cotton wood are common materials. Still spruce has remained the leading material, and it has been rarely the case that a pulp mill has cared to depend exclusively upon any other material besides spruce."



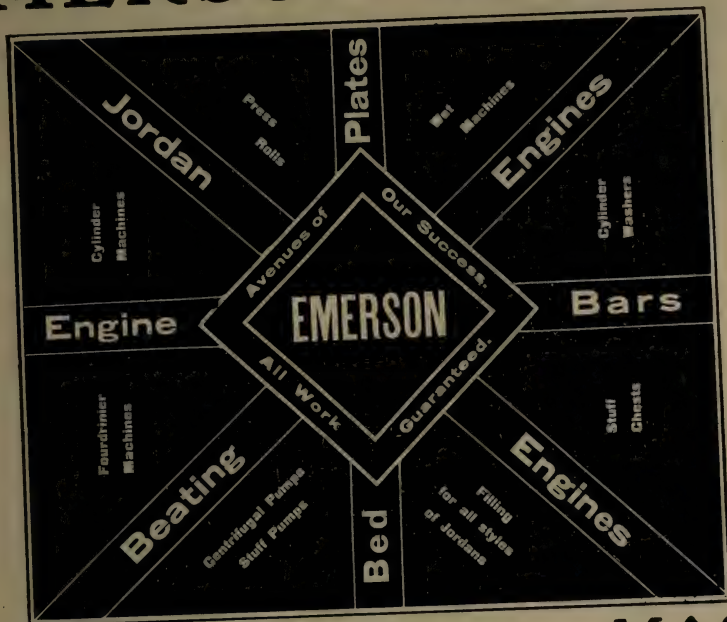
—The Treasury Department, at Washington, has revoked the action recently taken in assessing a duty of 35 per cent. on rossed pulpwood, pending further investigation. The revocation was made in consequence of a strong protest of United States pulp and paper men.

—The report of the Quebec and Lake St. John Railway, for the past year, just presented to the shareholders, shows that 2,256 cars of pulp-wood were conveyed over the road, containing 22,560 cords F. M., and weighing 65,160 tons; and 555 cars of pulp and paper were conveyed.

—A recent purchase of 197 square miles of timber land in the neighborhood of Three Rivers, Quebec, by the International Paper Co., of New York, brings the area of timber limits which the company owns in Canada to about 1,000,000 acres. The Gros Falls Co., controlled by share-holders of the International Paper Co., owns a saw-mill and water power, as well as spruce lands near Three Rivers. Report credits the company with the intention of building pulp and paper mills at this water-power.

—The mechanical wood pulp market in England is in a very depressed condition. Even at the present low prices buyers hold off from doing business. The demand is practically nil, and as production appears to have exceeded consumption, Scandinavian pulp mills have agreed to reduce their output. Manufacturers cannot understand the present depression in the pulp markets, as the outlook is more favorable from a paper maker's point of view, with an advance in prices on the Continent, and more activity among the news mills in Great Britain.

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BUILDERS OF

Machinery for Paper & Pulp Mills

REPRESENTED BY

The WM. HAMILTON MFG. CO., Ltd., PETERBOROUGH, Ont., Can.

PAPER STOCK MARKET.

Montreal, 11th June, 1903.

Paper Stock.—There is a fair demand for both new and old rags, and an active demand for most grades of waste paper. Reduced grinding power, owing to the low water, is probably affecting the output of ground pulp.

Recent forest fires have, no doubt, seriously affected pulpwood limits, and until the extent of the damage is known, there will be more or less anxiety on the part of manufacturers to secure their supplies of paper stock.

The domestic supply of country rags is coming in freely, as it always does at this season of the year. A difficulty is experienced by graders at the larger centres in getting hands to assort them, and for the time the better grades of cotton rags are scarce. Bagging is in full supply and very dull. Collections of Manila rope are as yet small. What sales have taken place are mostly to United States mills. Imported rope is offered at 11s. 6d. per cwt.—C. & F. Montreal.

We quote wholesale dealers' selling prices:

Domestic white rags,	\$2.25 to \$2.35	per 100
Blues and thirds	1.25 to 1.35	" "
Dark cottons	75 to 90	" "
Roofing paper stock..	50 to 60	" "
Waste papers	40 to 50	" "
Hard white shavings.	2.00 to 2.10	" "
Soft white shavings .	1.25 to 1.50	" "
Book stock	60 to 80	" "
Manilla rope	2.30 to 2.50	" "
Mixed bagging	60 to 70	" "
Sisal and jute string .	75 to 1.00	" "
Flax tow	1.10 to 1.25	" "

In Quebec the drought has been equal in intensity to that in the Eastern States, but the streams and rivers of Quebec are more permanent and the capacity for grinding will not be diminished except here and there. The chief danger in Quebec is that should the present rains not be sufficient to break up the drought, the operation of getting the timber down the streams may cause trouble for the coming season. Low water in a single stream may tie up 30,000 to 40,000 cords of wood. In some cases this will affect United States mills even more than Canadian. The latest reports, however, speak of cool and showery weather in Ontario and Quebec.



It is not possible to say what extent of pulpwood is burnt up by the forest fires in the Eastern States, and what effect it will have on prices, but one gentleman, interested in the timber limits of the Adirondacks, informs a Pulp & Paper Magazine representative that more spruce and other pulp-making woods have been destroyed since April of this year than have been burnt in the past 20 years. This of itself may or may not have an immediate effect on the pulp market, since Eastern United States mills have been holding these forests in reserve and drawing supplies from the Canadian side of the line; but looking beyond the present season, this destruction of raw material must have an effect on the sense of security of United States mill owners, while if the dry weather continues, supplies of pulp in hand will also be short before long.

Machinery For Sale.

2 Jordan Engines, in good order; 1 Stack, 39 in., super calenders, in store; 1 Sheet Cutter; 1 Rotary Boiler, 8 ft. x 24 ft., in perfect order; 1 Roll Grinder, will grind rolls 24 in. dia. x 124 in. face, in perfect order; 1 23 in. Leffell Water Wheel, complete; 1 40 in. do., some parts missing; 6 Return Tubular Boilers, 100 H.P., insured at 100 lbs. pressure; 2 Horizontal Slide Valve Engines.

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PARIS	Rue de Londres No. 29.
ANGOULEME (France) ..	43 Rue Louis Desbrandes.
LYONS	54, Cours Gambetta.
MILAN	3 Via Gius. Verdi.
TOLOSA (Spain)	18 Calle San Francisco.
ST. PETERSBURG .. .	Little Pedjascheskaja House, 4, Qu. 16.
NEW YORK	99, Nassau Street.

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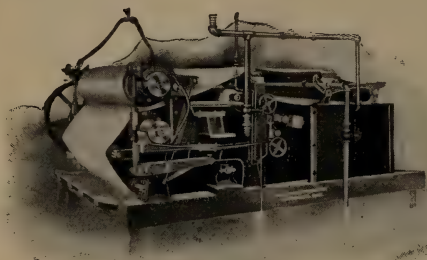
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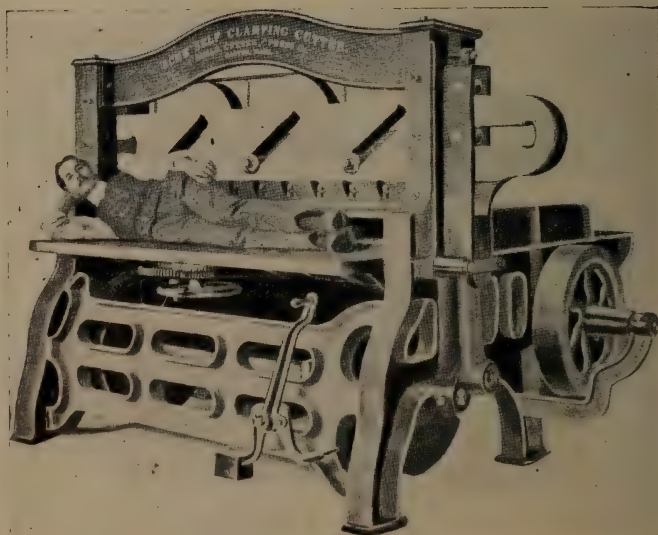
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Automatic Self-Clamping Cutter.

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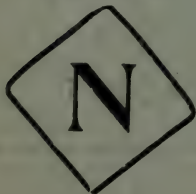
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PULP AND PAPER MAGAZINE

MONTREAL AND TORONTO

Vol. 1.

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Delivered price on application.

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SAMUEL SNELL, Holyoke, Mass.

Owing to the protests from the lumber and other interests of British Columbia, the Provincial Government has canceled the reservation of wood lands, which it had made in favor of the Island Power Co., as mentioned last month.

The annual sale of Quebec Crown lands took place on June 16th, and was largely attended by lumber merchants of Quebec, Ontario and the United States.

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The sale was one of the most successful so far, realizing \$365,039. Some 9,550 miles were advertised for sale, but only 2,760 miles were sold, the remainder being left over until next season.

—The importance of the paper and allied industries in Germany will be seen when it is stated that exports of goods classified as "paper and paper wares" in 1902 were of the value of £5,988,725. In the previous year the value was £5,087,255; in 1900, £5,874,509, and in 1899, £4,769,117. The increase last year, compared with 1901, was £901,470. The quantity of the exports during 1902 was 48,192 tons. In his report, Mr. Consul-General Schwabach mentions that all branches of the paper trade were depressed last year. The machinery in fine paper and journal paper mills stood still, either entirely or for some days in the week. The export was a little better than in the previous year, but it was only toward the end of the year that the demand was at all satisfactory.—Paper Trade Review.

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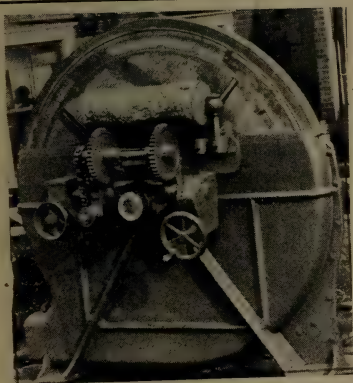
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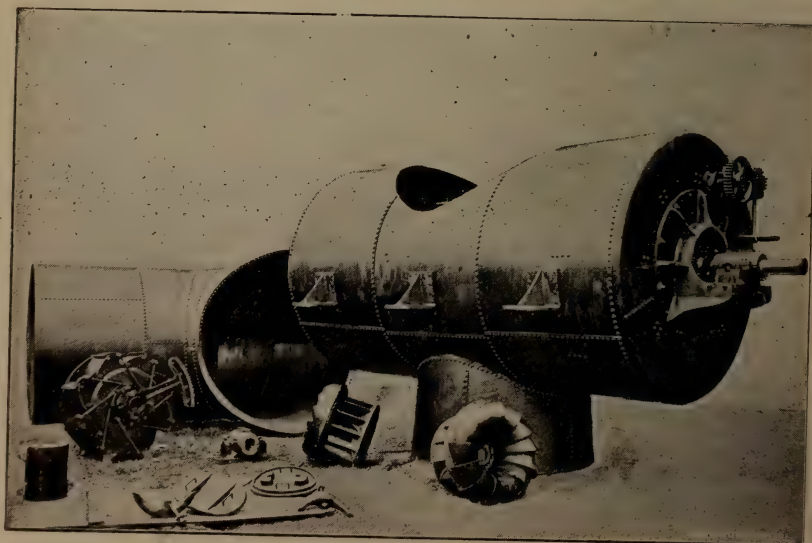
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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 3.

TORONTO, JULY, 1903.

{ \$1 A YEAR.
SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

SUBSCRIPTIONS: Canada, Great Britain and the United States, \$1 a year; to Foreign Countries, 5s. a year.

Changes of advertisements should be in the publishers' hands not later than the 1st of the month, and, where proofs are required, four days earlier. Cuts should be sent to the Toronto office, by mail, not by express.

BIGGAR-SAMUEL, LIMITED,
PUBLISHERS

18 Court St., TORONTO.

Fraser Bldg., MONTREAL

WE AND OUR NEIGHBORS.

In business enterprise and in adventure into new and untried fields many of our United States cousins show a daring that compels our admiration. This daring has resulted in the exploiting of certain resources of Canada, which would to-day have lain dormant, had they been left to the chances of development by British or Canadian investors. For the recent big development in the iron, steel and coal trades of Nova Scotia we are indebted largely to Boston men; for the great works of Sault Ste. Marie to a man from Maine, and for some of our largest and most successful pulp and paper enterprises to capitalists from other quarters of the United States. And in exploration in the northern regions of Canada of recent years, United States scientific and commercial men

have given evidence of their courage and perseverance. For example the two explorations of Labrador, about which we have learned most of late, have been made by United States parties, and now another party of American scientists is on its way to Labrador this month under the leadership of Col. Wm. Glazier. He is accompanied by Dr. S. A. Binion, a well-known Egyptologist, who will make collections in geology, etc., and act as physician to the expedition; E. A. Nelson, of Brooklyn; Dr. Frederick Martin, of Columbia University; R. E. Dahlgren, of the American Museum of Natural History; and A. W. McEvoy, of Brooklyn. Apart from the large extent of pulp timber and other timber in Labrador, that region, almost unknown to Canadian commercial men, is rich in certain classes of minerals, and has extensive water powers by which such resources can be developed. In sight of the activity and enterprise of United States explorers in this region, it is lamentable to note the supineness of our own Government and people in these matters. While millions are being voted for political railways, canals and other public works, the Government has kept Capt. Bernier dangling for the past two years on a half promise of a few thousands for his Canadian expedition to the polar regions, while this confiding and self-sacrificing navigator has spent \$25,-

ooo of his own money in enlisting the sympathies of Government and public men, and in preparing his plans. And still Capt. Bernier is kept navigating the air instead of his native element. If polar bears and Arctic whales had votes Capt. Bernier would not have to wait long for a subvention to equip his expedition; but as all he can show is that there are indications of coal seams for over a thousand miles of the regions he proposes to explore he will have to wait till some enterprising United States prospectors locate and develop these coal regions. Then perhaps he may regret that he banked on Canadian patriotism when he refused the offer recently made him by a New York capitalist who proposed to furnish the Captain with a complete outfit, ship and all, if he would sail under the flag of the United States. These things make us wonder whether our public men lack most in imagination or foresight in comparison with our neighbors; but whatever the defect we must confess that our friends across the border are keen and courageous crusaders in the commercial and manufacturing world, and in no sphere of operations have they shown greater enterprise than in exploiting and developing the pulp and paper industry and in the acquisition of choice timber limits in Canada.



POSTAL POLICY AND THE PAPER TRADE.

The persistence of the Canadian Postmaster-General, backed by the Canadian Press Association and boards of trade, has brought about a change in the postal relations of the colonies and Great Britain, which is bound to have a great influence on the social, commercial and political condition of

the British Empire; and incidentally on the paper trade of the Empire. After several years of urging from Canada, the Imperial Post-office Department has consented to receive Canadian newspapers at the same rate of postage as if mailed to any place in Canada or the States. This enables us to mail the Pulp and Paper Magazine to subscribers in Great Britain at \$1 a year instead of \$1.25 or \$1.50, which we should have had to charge under the old regulation; and our magazine may be sent in bulk by weight instead of affixing stamps, as formerly. Those of us who have watched the remarkable increase in the circulation of United States papers in Canada through having postal reciprocity between the two countries, have often wondered why British publishers and manufacturers have not awakened before this to a realization of one of the great causes of the striking increase in the Canadian imports of United States goods. Here is an evidence that trade follows the press and not always the flag. Every Canadian in business knows to what an extent new trade connections between Canada and the States have been formed by the circulation of newspapers and trade and technical publications between the two countries. Millions of pounds sterling of this trade would now be in British hands if it were not for the postal handicap under which the circulation of Old Country periodicals is choked off by antiquated post-office regulations and by a prohibitive rate of postage on newspapers, trade papers, catalogues and other literature. The Canadian and United States postal rates are framed so as to barely cover the cost of transporting mails, thus giving the public the benefit of the service; while in Great Britain the idea seems

to be to make the post-office a means of getting revenue—in other words, a means of raising taxes. The British public and press appear to have bent their backs uncomplainingly under the burden of this tax on knowledge, and have not yet realized that while their country is gaining a penny out of postal revenue it is losing pounds in trade that is diverted from British to American channels by the circulation of United States papers in the British colonies alone. Now, although Canadian periodicals, papers and other printed matter, under the new regulation, may go to Great Britain at our domestic rate, the British Postmaster-General has not yet reduced the postage on printed matter coming here. Yet a number of the colonies have already followed Canada's lead, and though only a few months have passed since the change, there is already reciprocity in newspapers between Canada and the following colonies: New Zealand, the Transvaal, Bahama Islands, Barbadoes, Bermuda, British Honduras, Ceylon, Gambia, Sarawak and Zanzibar. Other colonies will move along the same line, and Britain will follow—though it would be better for more reasons than one if she led the way. This great step in increasing and cheapening the means of communication throughout the British Empire will have a profound influence in unifying the peoples that compose this aggregation; and no doubt it will react for good on the relations of Great Britain and the United States, since it will be manifestly to the interest of the latter to share in such a reciprocity. It need hardly be said that the accomplishment of such a system of cheap postage throughout the Empire will mean a great deal for the pulp and paper manu-

facturing interests of Canada. Even without the Imperial preferential tariff, Canada will be able to furnish a constantly increasing proportion of the pulp and paper required by such a vast development of the newspaper, book and printing trades as would follow a cheap rate of postage throughout the British dominions beyond the seas.



—New uses are still being found for wood pulp. An English firm is advertising paper corks for bottles and the makers claim that they are superior in every way to the ordinary cork stoppers. Again a German firm states, as a recommendation of its special beer, that every drop of it is filtered through layers of wood pulp.



—As explained by our New York correspondent, the United States customs officers for the district of Vermont rather overdid the thing in assessing the duty of 35 per cent. on "crossed" pulpwood from Canada. It was a case of cutting off the nose to spite the face, for this ruling, if upheld by Washington, would have meant an increase of nearly \$3 a ton in the cost of newspaper alone. It would have meant a most serious embarrassment to a large proportion of United States pulp and paper manufacturers, and hence a sudden descent of protesting delegations from the pulp and paper districts upon Washington with the result that the ruling will be further considered. In other words, the duty is apparently dropped.



The importance of a scientific study of forestry has for years been recognized by countries like France, Germany, Austria, etc., but the lavish wealth of nature on the continent of America has

left these peoples careless—we may truly say, reckless—of the future of our woodlands. But now the United States has awakened to the fact that the depletion of some of its forests is already bringing home to the manufacturers of wood products some serious economic problems, and there are state departments of forestry in several States, besides the federal "Bureau of Forestry," at Washington, formed to work out plans for reforesting vacant territory. Cornell University and the University of Yale each has a forestry department; and it is time Canada began to turn her attention to a subject which, without any exaggeration, may be said to be vital to her future prosperity. Here is a good opportunity for some public spirited citizen to found a chair of forestry in McGill University and in the University of Toronto or Queen's.



Every month some new wood or fibre plant is brought forward in the States as a rival of spruce for pulp making, though these discoveries do not appear to lessen the interest which United States paper and pulp makers take in Canadian spruce limits. The latest report is that great results have been obtained at Orange, Texas,—the same city which gave birth the other day to the pulp process from waste pine—by making pulp from the tupelo gum. It is stated that the pulp produced from this material is almost pure white, and that a sample, which was run through the calendars and then bleached, came out as fine a sample of white news as anyone would wish to see. The experimenters claim that it will also make a book paper equal to any on the market. For the information of our readers it may be explained that the tupelo gum, so called,

is not a gum extracted from a tree like rubber, but the tree itself. It is known under various names, such as cotton gum, tupelo gum, and sour gum. It grows in swamps and river bottoms in the Southern States, and is a soft light wood of somewhat of the nature of Canadian basswood. It is used chiefly in turnery, and for the making of wooden shoes and floats for nets. As it grows only in wet, swampy soil, and is local in its habitat, it is not likely to make a serious rival to product of the mills of the northern half of the continent.



IMPROVED DRYING FELT.

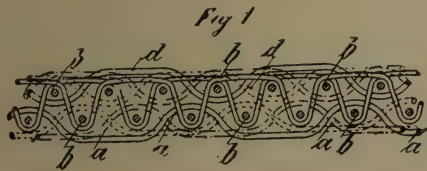
Ernest Rudiger, of Rodewisch, of Vogtland, Germany, has invented a new kind of drying felt for pasteboard and paper machines. The drying felts hitherto employed in the manufacture of pasteboard and paper are very suitable for absorbing the moisture set free in the drying path at the beginning of the work, but present considerable difficulties in the evaporation of the moisture over the felt-drying cylinders, the consequence of which is that a large part of the moisture always remains in the felt, and not only impairs its power of absorption, but causes it to rot and become hard so that the felt becomes prematurely unserviceable.

This inadequate elimination of the moisture is because of the thickness of the drying felt, which has hitherto been necessary to enable the felts to withstand the great tensional strain to which they are exposed. This is obviated in the present invention, the drying felt being made in the form of double fabric, the upper weft of which consists of soft spun yarn, capable of being fullled, whilst for the under wefts threads are employed which are firm and as little expansible as possible, and which may be provided with a special lining.

Fig. 1 is a section of the drying felt in the direction of the weft threads.

Fig. 2 a section in the direction of the warp.

The underweft (indicated in the letter a) consists of twisted woolen thread strengthened by a thin wire covering, in place of which, of course, any other thread capable of suitable tensile strength may be employed, the warp b on the contrary, the threads of which have to bear little strain, consists, as in the upper weft d, of loosely spun threads which can be easily made by milling in to a smooth surface felt. As the lower



weft a with the upper weft d and the warp b need to be only slightly felted, and are only employed for imparting the requisite strength to the smooth felt layer formed above the under weft, the under weft may be made of any material having considerable tensile strength—for instance, closely twisted and relatively thin yarns, whereby the felt, notwithstanding its great strength, is extremely thin, thus is far more easily freed from the moisture absorbed in the drying of the paper and consequently



less likely to rot or become brittle. The employment of thin spun yarn of great tensile strength in the back part of the drying felts is, however, only suitable when the latter, as is the case in the present invention, are made in the form of double fabric, as hereby the strengthened slightly-felted yarns of the under weft with the soft surface lie lengthwise of the felt in a spiral or screw shape line so that with but little felting they are capable of presenting the necessary resistance to the great tensional strain; whereas, in the case where flat weaving is effected and the ends are subsequently

spliced, the solid back entirely fails in its purpose, for since the threads at the seams cannot be knotted and only imperfectly connected with one another in the milling, the soft covering has to take the strain in these places, so that the strengthened drying felt also becomes prematurely unserviceable by the connection becoming loosened.



NORWEGIAN PULP TRADE.

C. E. Sontum, Canadian agent at Christiania, writing in May on the pulp trade of Norway, says: The bad collapse of the market for mechanical wood pulp, after a protracted period of shortage of production, strongly points to a considerable overproduction, and as the bids now coming to hand are even kroners below the cost price, the Norwegian pulpmakers fully acknowledge the desirability of, or rather the necessity for a large restriction of the output. The management committee of the Norwegian Wood Pulp Association is in active correspondence with the Swedish section in this question, and it is to be hoped that at the general meeting of both sections to be held in the near future an agreement may be arrived at. According to the leading trade paper here, competition from Canada also now must be taken into consideration on the European market, and it looks as if the manufacturers on this side are becoming well aware of Canada's increasing pulp production and chances for competing for the European trade.



John Murray, forest ranger for the British Columbia Government, has been commissioned to make a survey of the timbered country lying between Quatsino Sound and the east coast of Vancouver Island, to determine the nature of the forest growth. This is in order to settle some points which have arisen as to the delimitation of pulp limits, and the adaptability of the wood for that industry.

WOOD PULP INDUSTRY OF CANADA, 1902.

(From the Statistical Year Book of Canada.)

The wood pulp industry of Canada for the calendar year 1902 was carried on by thirty-five mills, which had an output of 240,989 tons of wood pulp. Of this quantity, 155,210 tons were mechani-

cal pulp, 76,735 sulphite, and 9,044 soda. The corresponding quantities for 1901 were: Mechanical, 169,360 tons; sulphite, 84,500 tons, and soda, 10,740 tons. This shows a decrease of 23,611 tons in 1902. The decrease is distributed: Sulphite, 7,765; soda, 1,696; mechanical, 14,150 tons.

The total value of the output of 1902 was \$4,383,182. There are several large

EXPORTS OF PULPWOOD.

Statement of the Value of Exports of Wood, Blocks, and other, for Pulp, from Canada during the Years ended June 30th, 1890-1902.

Year.	Total Exports. — (Produce of Canada.)	To Great Britain.	To United States.	To Other Countries.
1890	\$ 80,005	\$22,808	\$ 57,197	.....
1891	188,998	18,362	170,636	.....
1892	219,458	36,146	183,312	.....
1893	386,092	13,461	371,981	\$650
1894	393,260	24,250	369,010	.....
1895	468,009	9,396	458,613	.....
1896	627,865	27,580	600,285	.....
1897	711,152	33,931	677,221	.....
1898	912,041	34,772	876,690	579
1899	842,086	28,099	809,795	4,192
1900	902,772	38,370	864,077	325
1901	1,397,019	32,198	1,364,821	.....
1902	1,315,038	120,445	1,194,593	.....

Value of Wood Pulp Exported from Canada during the Years ended June 30th, 1890-1902.

Year.	Total Exports. — (Produce of Canada.)	To Great Britain.	To United States.	To Other Countries.
1890	\$ 168,180	\$ 460	\$147,098	\$20,622
1891	280,619	.....	280,619	.....
1892	355,303	.....	355,303	.....
1893	455,893	1,640	454,253	.....
1894	547,217	178,255	368,256	706
1895	590,874	251,848	336,385	2,641
1896	675,777	113,557	557,085	5,135
1897	741,959	164,138	576,720	1,101
1898	1,210,421	676,100	534,305	16
1899	1,274,276	671,704	578,229	24,343
1900	1,816,016	562,178	1,193,753	60,085
1901	1,937,207	934,722	937,330	65,155
1902	2,046,398	818,580	1,170,400	57,418

Note.—Trade Returns do not give quantities of wood pulp exported.

mills in course of construction, or which, being finished, did not operate during the year 1902. Two or three firms have gone out of business or manufacture only paper where before they made pulp. Nine of the thirty-five mills manufacture sulphite pulp and four soda pulp. Twenty-five manufacture mechanical pulp and four make both chemical and me-

chanical. Taking the returns of thirty-two mills the average time the mills ran during the year was ten months. The power to drive the mills is chiefly derived from water. Of a total power equal to 81,725 horse-power, 78,296 is water-power.

The growth of the industry is considerable. In the census of 1881 there

Value of Imports of Paper and Manufactures of, into Canada for Home Consumption during the Years ended June 30th, 1898-1902.

Paper and manufactures of—	1898.	1899.	1900.	1901.	1902.
Albumenized and other papers, and films, chemically prepared for photographers' use	\$63,376	\$78,420	\$109,204	\$112,433	\$105,333
Bags or sacks, printed or not....	6,565	8,273	13,029	31,996	30,296
Cards for playing	19,174	26,537	29,460	33,510	39,099
Calendered, including writing and note paper, ruled	4,439	11,812	11,477	9,411	8,571
Card board, paste board, in sheets or cut to size, N.E.S.....	24,052	33,792	36,066	38,107	42,431
Envelopes	*	26,281	28,582	27,518	31,416
Paper, felt or straw board, tarred	8,621	13,677	14,809	33,177	43,456
Paper, not tarred	722	1,727	2,630	758	3,393
Paper, hanging or wall paper...	111,138	79,222	93,572	110,127	192,483
Paper, borders and bordering ..	6,378	5,946	2,688	2,147	2,509
Leather board, leatheroid and manufactures of	13,647	9,513	6,323	18,022	19,859
Mill board, not straw board	15,149	19,636	17,871	26,228	22,342
Union collar cloth paper, in rolls or sheets, not glossed or finished	3,744	2,444	2,889	1,920	2,717
Union collar cloth paper, in rolls or sheets, glossed or finished..	895	1,096	1,472	659	154
Papeteries, pads not printed, papier-maché ware, N.O.P., and manufactures of paper N.E.S.	393,704	403,982	427,733	445,838	468,468
Printing paper	101,396	133,612	184,545	356,086	305,501
Ruled, border and coated and boxed papers	8,863	10,031	9,580	18,134	53,529
Straw board, in sheets or rolls..	12,122	16,674	16,721	10,324	7,779
Window blinds of paper of all kinds	1,245	953	414	....	....
Wrapping	14,046	18,525	19,720	25,740	34,298
All kinds, N.E.S.	326,628	361,211	378,716	501,789	532,152
Total paper and manufactures of..	\$1,135,904	\$1,263,364	\$1,407,501	\$1,803,924	\$1,945,786

* Included under the head, "Papeteries, pads, etc."

Note.—For value of paper and manufactures of, imported from Great Britain and the United States, in 1901 and 1902, see page 230.

The value of duty collected on imports of paper and manufactures of paper in 1902 amounted to \$549,245., or an average rate 28.23 per cent.

were five establishments with an output of \$63,000. In 1891 there were twenty-four with an output of \$1,057,810. The census returns for 1901 have not yet been tabulated. For 1902 the returns to the Statistical Branch preparing the Year Book show, as given above, thirty-five establishments with an output of \$4,383,182. Of the product of Canadian mills, the customs returns show that during the calendar year 1902 the export amounted to \$2,511,664, leaving \$1,871,518 for home use. In a general way, therefore, we export about fifty-seven per cent. of our production. Of the \$2,511,664 worth exported by Canada in 1902, Great Britain took \$976,192, the United States, \$1,518,139, and other countries, \$17,333. The market for this product

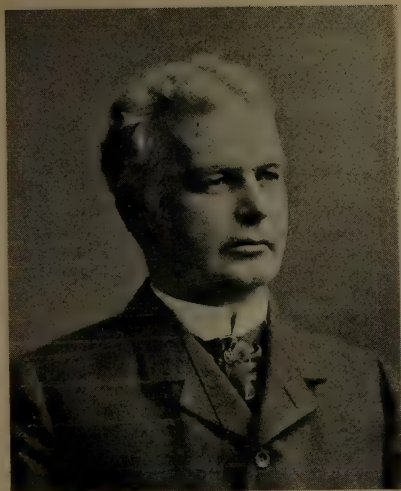
in the United Kingdom is large. In the calendar year 1902, the requirements of Great Britain were of the value of \$11,671,367, of which seven-elevenths were chemical pulp. Our export in 1902 to Great Britain was about $8\frac{1}{2}$ per cent. of her needs.

Quantities and Values of Wall Paper
Exported from Canada during the
Years ended June 30th, 1895-1902.

	Rolls.	Value.
1895	9,760	\$ 2,235
1896	35,967	3,593
1897	36,846	3,726
1898	117,857	13,639
1899	259,979	24,134
1900	273,516	29,741
1901	159,501	41,305
1902	246,075	24,780

Quantity and Value of Pulp of Wood Imported into Great Britain during the
Calendar Years, 1896-1900.

Countries.	Quantity.				
	1896. Tons.	1897. Tons.	1898. Tons.	1899. Tons.	1900. Tons.
Russia	7,431	3,551	3,211	264	2,155
Sweden	106,307	104,854	97,850	112,342	126,635
Norway	230,358	267,829	260,536	278,047	321,395
Denmark	1,265	1,254	1,145	665	252
Germany	4,904	6,368	3,611	3,299	7,595
Holland	5,868	6,258	5,498	5,449	5,360
Belgium	3,274	4,734	5,473	4,699	3,549
Portugal	1,620	2,362	2,249	1,966	2,821
Austrian Territories	1,301	613	285	....	321
United States	948	8,006	19,352	11,788	13,447
Canada	3,039	28,978	52,287	43,032	61,048
Other countries	10	93	1,916	3,375	1,693
Total	366,331	434,900	453,423	464,926	546,271
	Value.				
	\$	\$	\$	\$	\$
Russia	168,533	102,370	103,377	11,276	38,958
Sweden	2,878,618	2,941,087	2,697,389	3,430,698	4,039,338
Norway	4,352,085	4,786,235	4,604,797	4,679,606	6,439,111
Denmark	52,750	58,600	36,768	24,801	9,451
Germany	179,429	235,576	136,889	116,386	263,511
Holland	240,326	249,738	222,525	220,990	241,814
Belgium	140,442	222,417	151,611	159,719	114,191
Portugal	56,887	87,702	67,885	67,374	94,705
Austrian Territories	48,194	23,584	9,747	....	11,091
United States	35,361	263,612	331,853	306,220	269,579
Canada	45,601	465,258	834,088	637,280	1,199,317
Other countries	389	3,991	22,460	28,771	18,841
Total	8,198,615	9,440,170	9,219,389	9,683,221	12,739,907



HUGH J. CHISHOLM

The business career of Hugh Joseph Chisholm is a striking example of that enterprise and industry which has brought so many Canadians into eminence in the greater world outside of our Dominion in the present generation. Mr. Chisholm, whose features and name both convey a suggestion of a great English statesman now so much in the world's eye and mind, is now head of the International Paper Co., a corporation owning or controlling 29 paper and pulp mills in the United States, besides having considerable interest in pulp timber limits in Canada. He was born on May 2, 1847, in Ontario near the Niagara river and was educated in local schools and afterward in a business college at Toronto. Then, at the age of 16 years, he entered practical business life. His first engagement was in the railway news and publishing line, his business covering four thousand miles of road and employing 250 hands. But by the time he had reached his first quarter century he began to turn his attention to the great enterprises with which he is now identified.

According to a sketch in a New York paper it was about the year 1882 that Mr. Chisholm observed the splendid natural advantages offered by the upper reaches of the Androscoggin River in

Maine for manufacturing purposes, in the form of an inexhaustible supply of pure water and practically unlimited water-power. For years he planned to secure there a suitable tract of land for the establishment of an industrial town. He was then in business at Portland and made many a trip up the Androscoggin, not merely for hunting and fishing, but with great enterprises in his mind's eye. In the late eighties he got control of the land that he wanted, and also of the then moribund Rumford Falls and Buckfield Railroad. The latter he promptly developed into the Portland and Rumford Falls Railway, which was opened to traffic in August, 1892. In the meantime, with his associates, he improved his eleven-hundred-acre tract of land on the Androscoggin and built the industrial town of Rumford Falls. When he organized the Rumford Falls Power Company in 1890, with \$500,000 capital, there were only two or three log cabins at the place. When the new railway was opened in 1892, there was a town of more than three thousand population, which has now increased to seven thousand and with great mills, stores, schools, churches, newspapers, a fire department, electric lights and "all modern improvements." The chief industry of the place is the manufacture of wood-pulp and paper. The Androscoggin furnishes an unsurpassed water-power and water-supply, while the surrounding forests provide the wood. The works at Rumford Falls include everything necessary for the transformation of logs of wood into sheets of paper. There are mills for cutting up the trees, chemical works for making the chemicals used in reducing wood into pulp, and paper mills for turning out many tons of finished paper each day. The place presents an unsurpassed exhibition of the achievements of American ingenuity and enterprise, and is a splendid monument to the genius of the man who called it into being.

Mr. Chisholm is the president and the controlling owner of the Portland and Rumford Falls Railway, and president, manager and controlling owner of the Rumford Falls Power Company. But

his interests do not end there. He was, before the creation of Rumford Falls, the chief owner of the Umbagog Pulp Company, the Otis Falls Pulp Company and the Falmouth Paper Company. He is also a director of the National Bank of North America, which is one of the largest and strongest financial institutions in the country, which has just erected a twenty-five story building on Wall Street. Nor did his enterprise stop with these things. Observing the tendency of the age toward great combinations of business interests, by which cost of production is lessened, injurious competition obviated and profits increased to the producer and cost reduced to the consumer at the same time, he planned, and with his associates finally executed, such a combination in the paper trade.

The result was the formation of the International Paper Company of New York, which was legally organized in 1898, with \$25,000,000 cumulative 6 per cent. preferred stock and \$20,000,000 common stock. This giant corporation has acquired by purchase the manufacturing plants, water-powers and wood-lands of thirty paper-making concerns, which produce the great bulk of the white paper for newspapers in North America. These various mills produce over fifteen hundred tons of finished paper a day. The company holds the title to more than 900,000 acres of spruce wood-lands in the United States and license to cut on 2,500 square miles in Quebec, Canada. Mr. Chisholm is the president of this corporation. Though he has held no public office, he has taken a keen interest in public affairs and is an earnest member of the Republican party and upholder of its principles. He was married at Portland, Maine, in 1872 to Miss Henrietta Mason, daughter of Dr. Mason of that city, and has one son, Hugh J. Chisholm.



Some of the Canadian mills producing the better grades of note and envelope paper have raised their prices half a cent to a cent per pound, on account of increased cost of materials.

RAQ PAPER MANUFACTURE.

In last issue an abstract was given of one of a series of lectures by Julius Hubner, before the Society of Arts, London, on paper manufacturing processes. A summary is now given of another of the series, the subject being rag paper manufacturing, and rag paper substitutes.

The lecturer mentioned that the Chinese for many centuries used fibre obtained from a number of different plants for the manufacture of paper. Rags were used exclusively in Europe up to the middle of the nineteenth century as papermakers' raw material. A writer of a book, Schaeffer, dated 1756, fully appreciated the necessity of finding raw materials other than rags, and suggested sawdust, moss, willow, aspen, hemp, rye, straw, thistle stalks, peat and even wasps' nests, but the descriptions given were most incorrect. There was no reason to doubt that Schaeffer communicated no good theory to the papermakers, and that finding a difficulty in getting a satisfactory paper according to his description they no doubt used rags without his knowledge. At the end of the eighteenth century Matthias Koops experimented on the use of straw, hay, and also old papers for making paper, and he might therefore be considered the first who employed rag substitutes in a practical manner. Among numerous substitutes described, only six were found of any technical application, and the lecturer, proceeding to describe these, first named esparto grass, the successful introduction of which into England in 1856 was due to the well-known papermaker, Thomas Routledge. The process of treating esparto was exhaustively dealt with, from its reception in the mill, through all the stages of picking, dusting, and the special machinery required for it, boiling and the large amount of caustic soda required, and bleaching. In connection with the boiling process, a slide of a vomiting boiler was thrown upon the screen. Two modern types of esparto boilers differed from the type just shown in one important respect: the vomiting pipe, instead of being placed inside, was placed outside the boiler, and

the entire interior of the boiler was available for grass. A couple of slides were shown, illustrating the arrangement of a mill for treating large quantities of esparto to grass. The next raw material referred to was straw. Straw cellulose, that was pure straw pulp, might be obtained from the various kinds of straw, such as wheat, oat, rye, barley, and maize. Though straw in ~~many~~ respects closely resembled esparto, it yielded in general much less pulp. It was used largely in the commoner class writings and printing papers. The straw mostly used was that from wheat, oats and rye. Although it contained as much cellulose as esparto, a large proportion was lost during the various operations it went through. That explained its invariably lower yield in cellulose. The operations of cutting or chopping, followed by dusting and washing in spherical boilers were explained, the lecturer adding that to obtain a uniform disintegration of the knots and other hard parts of the straw not sufficiently acted upon in the boiling, it was the practice in some mills to pass the pulp between a pair of rapidly revolving millstones. Breaking, in the proper sense of the word, however, was not required in respect to straw, only the complete separation and brushing of the fibres. The only effective way of displacing all the colors from esparto and straw was by the use of soda. Methods of doing this were referred to, and the processes of incinerating and causticizing were briefly touched upon. In regard to the former process, it was pointed out that the ordinary incinerating furnaces were now substituted by the revolving incinerating type, and in connection with the latter, Brunner, Mond's causticizing process in which ferric oxide was used was mentioned. Manilla hemp then came under observation, and on account of its extraordinary strength, formed a valuable raw material, especially where color was of secondary consideration. Jute, Adansonia, and Flax Waste were referred to, it being pointed out that Adansonia was a fibre remarkable for its strength and toughness. It was not unlike a Japanese paper. The boiling and bleaching of all these raw mater-

ials were described. Peat next came under notice, it being first used as a paper-making raw material by Schaeffer in 1765, and had been tried by various firms, up to the present, however, with little effect. Only lately a process had been introduced by which the peat was disintegrated by a special method, and in this way quite satisfactory results had been obtained. Sugar cane and the various kinds of reeds were briefly mentioned, and passing on, the lecturer said, of considerably more importance to them was the "broke" paper, paper which had been printed upon and finally found its way back into the paper mill, as well as such paper as had been rejected when the paper machine was started or when the paper on the machine accidentally broke. It was divided into various qualities, and the treatment had to be chosen accordingly. The lecturer then came to a raw material of very great importance, viz., Mechanical wood pulp. Reiterating his statement that Matthias Koops might safely be considered as the first who used wood in a practical manner for paper-making, the lecturer drew attention to two copies of his book, now over 100 years old, both of which were printed on paper made from wood, and the leaves were in a state of perfect preservation, as those present could see by a copy he had brought with him. In that book the front page was a paper made from straw, a part of the book was composed of paper made from "broken" paper, and the other part paper made from wood. The straw paper was naturally of a very yellow color. Whatever might be justly brought forward against wood as a raw material, it was outweighed by the benefit they had derived by its introduction. This took place in the year 1816. Keller was the inventor of mechanical wood pulp. He started to successfully experiment with wood in 1840, but in 1846 he had practically lost his share in his invention. All he received amounted to but a few pounds, and in 1892 an appeal for help was made to the papermakers of the world. It was worthy of mention, the lecturer thought, that a collection was made in the various countries, which real-

ized the sum of £1,000. To this the papermakers of this country contributed £22. The various operations of turning wood into pulp were explained with the aid of a number of diagrams thrown upon the screen. It was stated that brown mechanical wood pulp, first introduced in 1868, was now very extensively used in the manufacture of cheap brown wrappings, as a substitute for hemp and jute. The extensive manufacture and use of chemical wood pulp obtained by treating wood chemically, and its essential difference from mechanical wood pulp, was spoken of, as also the numerous processes that had been discovered and patented for this purpose, only a few of which had found technical application. After remarking on the use of wood nowadays in combination with rags, straw, cotton and other fibres for various purposes, and of the enormous industry of the manufacture of wood cellose, the lecturer gave an outline of the different processes in use at the present time in its treatment, beginning with the soda process. He spoke of the several beating machines from early ones down to the modern ones, and their particular characteristics, naming among the latter Reed's and Taylor's patent beaters. The final beating or brushing of the pulp, he pointed out, might be conducted in the so-called refining engines. These were of American origin, and the one used extensively in Great Britain was Marshall's refining engine. He remarked on the importance of purity of water in the preparation of the best papers and of those of delicate tints.



STRAWS THAT SHOW HOW THE WIND BLOWS

A New York correspondent writes us: It will interest you to know that when the 35% duty was ordered to be collected on rossed pulp-wood, it came like a bomb shell in the camp of the papermakers on this side. Delegations were at once started for Washington to inform the Secretary of the Treasury that while theoretically the imposition of this duty might seem to affect the Canadian supplier, practically the consumers at this

end, viz., the papermakers, would be obliged to stand the duty, and that in view of the long contracts already in hand with the consumers, viz., the publishers, they would be unable for a considerable period of time to do other than take this out of their own pockets. Political pressure of the highest order is being brought to bear most energetically to have the Secretary of the Treasury suspend indefinitely the order, and not have the matter carried to a judicial determination, for my friends the papermakers are advised by their counsel that if this should be done the ruling would undoubtedly stand, and while our friends would continue to get wood from Canada, it would necessitate their getting the wood with the bark on. Even this would increase the price of the wood over 50% of the duty. You can, of course, understand that we are particularly pleased that Uncle Sam has put this order in force, and we are very hopeful that it will be made permanent. First, because it won't interfere appreciably with the selling price of pulp wood in Canada, but will directly enhance the cost of making paper in this country. This in turn will start an energetic campaign to remove the duty entirely from ground wood pulp brought into this country from Canada, and the moment this takes place the pulp mills will spring up in Canada like mushrooms. Don't let your people get frightened through the efforts of the press bureaux conducted in the interest of the United States manufacturers of paper, who are anxious to get raw material from Canada duty free.



THE FAIRBANKS COMPANY.

The above company, which is the largest Supply House in Canada, has recently opened up a branch warehouse at Winnipeg. The first Canadian branch of the Fairbank's Co. was started in 1898 at 749 Craig St. As early as 1900 the business had outgrown these quarters and the adjoining warehouse at 747 Craig St. was then secured. The growing trade in British Columbia and the North West Territories required increasing energies and facilities for taking care of the busi-

ness and in consequence branch warehouses were opened recently at Vancouver, B.C. and Winnipeg, Man. The company now finds its Montreal warehouse altogether too small for the rapidly increasing business, and is now negotiating for an addition, the floor space of which aggregates 24,000 sq. feet. In addition to the celebrated Standard Scale department, the Fairbank's Company carries the most complete stock of pulp and paper mill supplies in Canada, and is therefore in a position to make prompt shipment, which is a very desirable item in the pulp and paper mill supply business. Among the large stock of supplies may be mentioned the Fairbanks Renewable Asbestos Disc Valves, Acid Resisting Bronze Globe Valves, Semibronze Packing, Rubber and Leather Belting and Cole's Patent Coronet Belting, for which the company is sole Canadian agent; the Buffalo Forge Company's fans and blowers, Dodge celebrated wood split pulleys, Yale and Towne chain blocks, shafting and hangers, engines and pumps, and a full line of pipe fittings and tools. The company also manufactures special styles of trucks for handling paper in rolls as well as ream paper and pulp. A full line of tools and requisites for paper and pulp mills is also carried, such as paper scales, micrometer calipers, speed indicators, etc., etc. The Fairbanks Company issues the most complete mill supply and valve catalogue in Canada, and will be pleased to send it to any interested readers of this Magazine.



SAMPLING PULP FOR MOISTURE.

La Papeterie publishes an article on the sampling of wood pulp, by J. Persoz, director of a paper testing laboratory in Paris. The author remarks that everybody who has had occasion to ascertain the degree of humidity contained in bales of pulp, with a view to fixing merchantable weight, knows how delicate the operation is, owing to the irregularity of the hygrometric condition of such materials. This is perhaps not so much due

to any fault in manufacture as to the changes of temperature to which the bales are exposed in course of transit or on the premises of the consignees, where they are sometimes piled up in sheds, sometimes left in yards or on the open ground, without any shelter at all, and thus subjected alternately to the action of the sun and the rain.

It is evident, therefore, that it is necessary to take note of the differences of humidity that may exist, not only between one and another, but between parts of the same bale, or even of the same sheet. In order to illustrate the importance of this, M. Persoz gives the following tables, showing different percentages of moisture that he has found in actual practise. The first table gives the differences between various sheets taken from the upper part of a bale of brown moist mechanical pulp, and working down toward the middle.

	Percentage of Moisture.
1st sheet	32.9
2nd "	34.9
3rd "	37.8
4th "	38.6
5th "	40.5
6th "	41.5
8th "	43.6
10th "	44.2
Sheet from the middle.....	50.2

In the second table is given the percentages of moisture observed in pieces (of a width of about 10 centimetres, say 4-in.), taken from the outer edge of a sheet of pulp and also from the inner portion.

	Percentage of Moisture,	
	Outer Part of Sheet.	Inner Part of Sheet.
Brown pulp	58.8	55.2
" "	59.2	58.2
" "	54.5	62.
White pulp	57.4	52.9
" "	48.7	53.3
" "	49.8	52.5
Dry pulp	16.9	17.8

In the third table are some details respecting the percentages of moisture found in sheets taken from the upper part, middle, and bottom of the bale.

	Percentage of Moisture,		
	Top.	Middle	Bottom.
Brown pulp .	47.2	61.7	63.7
" " ..	27	52.2	44.9
" " ..	52.1	55.3	53.8
" " ..	39.9	53	51
White pulp ...	42.8	54.8	45.9
" " ...	37.4	56	47.3
" " ..	70.3	64.8	68.5
" " ..	42.8	55.7	60.8
Dry pulp	12.1	13.7	—

The results of these tests seem to prove that, if exact results are aimed at, it is desirable to take a large number of samples from each bale, sampling the different parts in regular order. In conducting the sampling at mills, M. Persoz suggests that the person performing the operation should take sheets at a distance of about two inches from each other, beginning at the top of the bale (as seen in the position in which it is usually placed for sampling purposes) and thence proceeding steadily down to the bottom. The samples should take the form of strips of pulp for 3 to 4 centimetres in width ($1\frac{1}{4}$ to $1\frac{1}{2}$ inches) across the middle of the sheet from one side to the other, taken alternately from the long and the short way of the sheet, so as to make sure that the four faces of the bale are represented in the tests.

Assuming the bale operated on to be about two feet thick, a dozen such samples would be taken from it. It is desirable that they be rectilinear and of uniform width. In order to ensure these conditions, M. Persoz's laboratory has constructed a cutting instrument that has proved very satisfactory. It consists of a sort of rigid fork, having a pair of sharp blades about $3\frac{1}{2}$ centimetres apart. The samples thus cut should be promptly weighed in the scale with which every pulp sampler is provided, and afterward carefully wrapped up. The choice of bales to operate upon is, of course, a point of importance, as only those which are in good condition should be selected for the purpose. Mechanical white moist

pulp being very friable, and thus liable to take a good deal of harm from the knocking about which the bales receive in their various journeys from producer to consumer, makers of this class of pulp would advance their own interests by dispatching it only in canvas covered bales.



RECOVERING FIBRE FROM WASTE WATER.

A short time ago I visited a paper mill which grinds its own pulp and makes nothing but brown wood pulp paper, which is turned out on three large machines. One of the staff drew my attention to an ordinary looking wooden box, with the remark that that box saved the firm about £300 a year although it had been in use only a few years. Into this apparatus—if a plain wooden box about 65 feet long and about 10 feet wide can be called such, and the walls and bottom of which are covered with laths with old machine wire cloths stretched over them—is emptied the waste water from all three paper machines; the fibres mostly remain in the box, while resin, alum, coloring matters, etc., in great part, pass away with the water through the wires. It will be readily seen that it is a matter of very great importance to both a paper and a pulp mill to recover all fibre carried off by waste water. A comparatively large sum is irrevocably lost every year by those mills who have no means in their outfit for this purpose, and there are unfortunately far too many mills where no attention at all is paid to this important item. Although the water required for the paper-making machines is used repeatedly over and over again in most mills, the usual practice being to let it run down to a low-lying source and then pump it up again by means of a pump or elevator buckets, and although much has been written time and again in the technical press about the recovery of fibre, size, and loadings, from waste water, tons of fibre are lost every year in this way. It is quite true that of recent years the recovery apparatus built by Schmidt, Wandel, and other houses

effect some saving, but what is their gain compared with the quantities of stuff which are lost in the waste water? Apart from the fact that the waste water does carry away a small quantity of fibre with it in the ordinary course of things, it is frequently unavoidable even in the best managed and equipped mills to prevent considerable quantities of fibre from being lost with the waste water at certain times; even the loadings which are not attached to the fibres are always found in the waste water. Again, every mill at certain periods has to clean up its plant; sand filters, strainers, etc., have to be cleaned, cloths and grids replaced, and as in such case the machines have to be stopped, the loss of fibre carried away by the waste water is considerable. It also sometimes happens that the cylinder boxes in a pulp mill run over, when a belt breaks suddenly, or the boxes get choked for want of water, and also in a paper mill a good deal of stuff gets under the machine through breakage and other causes—e.g., when cleaning up the chests and hollanders, or owing to carelessness on the part of the staff. Cases of this kind are endless, but those mentioned must suffice. In addition to fibre, resin, aluminium, sulphate, clay, coloring matters, starch, etc., are also lost, and it should be every manufacturer's and every works manager's constant care to keep this loss down to the lowest possible extent.—W. in *Holzstoff Zeitung*.



TESTS OF SIZING.

The extent to which a paper is sized is determined in a rough and ready manner by the application of the tongue to its surface. If the moisture sinks in rapidly the paper is regarded as being only slightly sized. Of course an empirical standard of suitability is thus set up, which probably in many cases is sufficient for the purpose, but such a method is quite inadequate when the degrees of sizing have to be compared more closely.

The methods employed in Germany for testing the water resisting properties, or sizing qualities of paper, may be describ-

ed under three heads. Attempts have thus been made to express the extent to which a paper has been sized in numerical terms, and, although such terms are arbitrary, they afford some degree of comparison permitting of repetition by other experts. The test for the strength of sizing may be made.

(1) By the writing of characters or lines on the paper with different strong inks.

(2) By the Leonhardi method, which is based on the reaction between iron chloride and tannic acid, resulting in the formation of a more or less dark coloration when these reagents come into contact.

(3) Schluttig and Neumann's method which is a modified and improved form of the iron chloride and tannic acid reaction as originally devised by Leonhardi.

In the first method three kinds of ink are usually applied to the surface of the paper. The strongest and most penetrating is the ink prepared from logwood a medium ink being the ordinary fluid obtained from iron and gallnuts, while for weak inks alizarine and aniline colors are used.

Evidence of the strength of sizing is obtained by watching the spread of the ink. With a badly sized sheet the ink tends to spread. Then the disappearance of the little ridge of ink produced by the pen, as the ink penetrates the paper, is a useful indication. With a poor sized sheet the ridge quickly reduces. In this connection the writer has found the following test of some service: Allow one drop of chloride of iron, or of one of the inks referred to, to fall upon the sheets of paper to be compared. At first the drop is strictly spherical, but after awhile it becomes slightly flattened and covers a larger area. With well-sized papers the drop will retain its spherical form for a considerable period. This test is only an indication, and cannot be used under all circumstances.

In the ordinary application of the test with these inks it is usual to draw a cross, consisting of four strokes, two parallel to one another in the horizontal direction, and two parallel to one another in the

vertical direction across the former. Two of the strokes are thin and narrow; the others broader.

Leonhardt's process for estimating the sizing quality of paper is an advance upon the ink method. A chloride of iron solution of definite strength containing 1.53 per cent. of iron and a 1 per cent. solution of freshly prepared tannic acid are required. As originally suggested, the test was carried out in the following manner:

A number of parallel lines are drawn on the paper with an ivory-pointed drawing pen, the fluid used being the chloride of iron. The ink is allowed to dry, and the paper reversed, an ethereal solution of tannic acid being poured upon it. Excess of solution is run off or removed by blotting paper. Any black coloration produced is evidence that the iron chloride has penetrated the paper to a sufficient depth to come in contact with the tannic acid.

The rough and ready nature of this test is open to many objections. In its modified form the process can be conducted as follows: fit up a burette or pipette in a suitable stand, so that the lower end is about four inches from the table. Place the paper to be tested under the burette and allow one drop of the chloride of iron solution to fall on the surface of the paper. Keep the drop on the paper for as many seconds as may be equal to the weight of the paper in grammes per square metre. Then remove any excess of solution quickly with blotting paper. Reverse the paper and moisten with the 1 per cent. tannic acid by means of a pad of cotton wool, taking up any excess with blotting paper. The extent of the coloration is a measure of the strength of the sizing.

Even this test is merely an empirical one, and the results obtained are of a somewhat negative character. That is to say, one can readily sort up a number of papers into two or three classes, but in the case of samples which may all happen to be well sized no effects will be produced, and in this way the test is of no service in discriminating between well-sized papers. For many purposes such a

degree of refinement may be unnecessary, but it is obvious that, under special circumstances, a delicate "surface" test would be necessary.

It should not be very difficult to devise modifications of any such "surface" tests as these to suit a particular case. As a matter of fact, the reaction between chloride of iron and tannic acid has been made the basis of a process in which the conditions have been modified so as to eliminate the errors due to manipulation as far as possible. This is the Schluttig and Neumann test, a full description of which appears in Herzberg's "Papierprufurg," second edition, recently published.—R. W. Sindall in Paper Maker's Monthly.



WASTE LIQUORS FROM CELLULOSE.

It is well-known that plants and woods of all kinds contain gums or viscous substances which hold together and surround the separate cell tissues. These substances are generally known as the intercellular substance or incrustation. In addition to this there are also present in the wood cells, resins, terpenes, tannin, ranillin, oils, coloring matters, and the like. The ordinary gums or glue-like substances can be dissolved out or extracted by water or steam, but the slimy kinds of gum, the oils, terpenes, tannin, resins, wax, etc., cannot be extracted and separated by ordinary cold water. This is best effected by the treatment to which the wood is subjected to obtain cellulose. When the finely divided wood is treated under pressure in large boilers with a solution of calcium sulphite, the pure wood fibres are gradually freed from the incrustation, and the gummy matters, resins, etc., remain dissolved in the waste sulphite liquor. In this process a large percentage of wood or cellulose fibre is unfortunately lost, for even with the best wood, finest apparatus, purest liquors, and the greatest care in carrying out the process, 20 to 30 per cent. of fibre at the least is lost. A very extensive field is thus opened to science to devise ways and means to obtain greater yields of fibre, whereby large sums could be saved.

The lost cellulose fibres are partially converted by the sulphurous acid, and more highly oxidized sulphuric acid, into hydro-celluloses or oxycelluloses, which are further decomposed into dextrin, sugars, etc. The resin, turpentine, gums, etc., originally present in the wood are also, after the boiling is completed, no longer present in the cellulose liquors in their original form, but all kinds of decomposition products have to be dealt with, such as acid salts, resins, and similar compounds, which can only be analyzed or separated into their constituent components with difficulty. Since the foundation of the cellulose industry, chemists have labored unremittingly in this field, but mostly in vain, and up to the present not much has been done with the waste liquors. In the first place the great dilution of the liquors as they leave the mills makes the examination and further treatment of the liquors a very difficult matter, as the manifold decomposition products of the constituents of the wood and waste liquors cannot be separated from each other. In England, Ekman precipitates the glue and gummy substances from the liquors by means of alcohol, ammonia, and other chemicals, and utilizes the adhesives on a commercial scale for the textile trade. In the eighties and nineties various patents were taken out for the practical utilization of waste sulphite liquors. The chief ones were (1) the production of wood glue from waste cellulose liquors, (2) recovery of tanning materials, (3) obtaining alcohol by means of fermentation with yeast, (4) tannin glue. The first patent for obtaining wood glue does not seem to have been successful. The glue was too brittle when dry, and the glued surfaces readily split apart. The method of preparation was, however, very simple; the dilute liquors were simply concentrated in vacuum pans, and then treated with the necessary inorganic substances. The recovery of tanning materials from the waste liquors has also been of very little practical use. In all cases it is very difficult to separate the multitudinous mixed chemical de-

composition products of the various carbohydrates in the waste liquors from each other. Although it is easy to separate the inorganic salts and compounds, both by physical and chemical means, from the organic substances contained in the liquors, it has not, unfortunately, been possible hitherto to isolate the tanning materials or compounds containing them from the other constituents. Such work has yet to be done in this direction.

As above mentioned, much valuable fibre is lost in the process of boiling, the cellulose fibres being dissolved partly by the sulphurous acid, and partly by the sulphuric acid and finally converted into dextrin and sugar. A proposal was made to obtain alcohol by fermenting the liquors and the experiments carried out succeeded well qualitatively; the process, however, broke down from a practical point of view on the extreme dilution of the liquors. The expenses of concentrating and neutralizing and the subsequent treatment of the liquors, compared with the small amount of alcohol obtainable, have hitherto been too high to make the method profitable. Better results seem to have been attained in the attempts to prepare what is known as tannin glue or size. The substance is a mixture, more correct by a compound of animal size, glue, and tannin, and very suitable for sizing paper, but concentrated solutions being always of a dark color, and as it is not possible to bleach the substance, it cannot be well used for fine writing papers.

The yield of cellulose prepared by the sulphite process is, according to practical experience, higher than that obtained by the older soda process, nevertheless many mills still make soda cellulose. As above mentioned it depends on the quality and method of using the raw material. The residual liquors are usually evaporated down and calcined, and the caustic or carbonated soda and sodium sulphide recovered from the ash; the usual amount recovered being 70 per cent. of sodium carbonate, about 15 per cent. of sodium sulphide, and from 4 per cent. to 5 per

cent. of sodium sulphate, including a few per cent. of substances insoluble in water. In the soda process it is possible by suitable apparatus to recover the turpentine oil from the wood, but no method has hitherto been found for separating the ranillin.

Of late years the huge quantities of waste liquors produced in the cellulose manufacture have been an intolerable nuisance to pulp mills, especially those not situated near large rivers. Even where the acid liquors were neutralized with lime and then largely diluted with water, serious objections still remained to their disposal. All sorts of complaints were made by neighboring owners of the land and waterways. Fish were poisoned, crops spoilt, the river waters below the mills polluted, and the pulp mill owners were well-nigh at their wits' end to know what to do. The method now generally used is to evaporate down the liquors in vacuum pans, and then calcine the residues in specially constructed furnaces, sulphur and various salts being recovered from the ash. Complaints have even been raised against this process, manufacturers complaining that when the wind blew in their direction they were inconvenienced by the sulphurous gases in the air. This is, however, unreasonable, as the quantity of sulphur dioxide escaping from the furnaces is never very much, and what there is is beneficial rather than noxious, killing bacilli and germs of many kinds. All the above, however, goes to show that cellulose makers have not yet reached the summit of economy in dealing with this waste product, and large sums are daily and yearly lost in this way. The whole cellulose and paper trade would hail with gratitude any process which chemists could devise to utilize the valuable carbohydrates dissolved in the waste liquors, so that they could be made a source of revenue in trade.—Dr. B. in *Holtzstoff Zeitung*.



—The Pulp and Paper Magazine is a very neat and readable publication. The initial issue augurs well for its success in the future.—The Paper Maker, London, Eng.

MILLBOARD MANUFACTURE.

In order to obtain hard boards, it is necessary to run a thin sheet on the machine, and the cylinder must be provided with a fine outer wire, such as No. 70 or 75. A good help in obtaining hard and, at the same time, flexible boards, is the addition of 3 or 4 kilos, of "collodin" to the beater for every 50 kilos, of raw material charged. "Collodin" is a smooth paste prepared from 10 kilos. of potato-farina, 1 kilo, of caustic soda, and 45 litres of water; it tends to bind the short fibres, thus reducing the loss. In order to avoid irregularities in the boards, the sand-traps must be kept clean, and great attention must be paid to the settling-laths and boards. The accumulation of clotted pulp on the stirrers of the stuff-chests must also be prevented. Hard millboards are apt to wrinkle during glazing more than soft ones. When the boards come from the drying-rooms and are damped for rolling, they should be allowed to stand for one or two days. If they still wrinkle, the pressure on the front guard roll of the glazing press should be eased, as it is a great mistake to load this roll too heavily.—*Papier Zeitung*.



PAPER BARRELS WANTED.

The United States Consul at Patras, Greece, writes to his Government: Enquiries have been made at this consulate, by one of the most extensive wine companies of Greece, for the names of American manufacturers of barrels from paper. That such a process has been reached among our manufacturers I have no reason to doubt, as compressed paper has come to serve the purposes of wood, and occasionally of iron, in many instances, but in the lists of manufactured products on file in this office there is mentioned no factory of paper barrels. One of the obstacles which the wine trade is constantly meeting is the expense connected with the importation of staves and casks. There is no timber suitable for local manufacture, so that exporters of

currants, as well as manufacturers of wine, must depend entirely upon the foreign markets for their supply of staves.



TEST FOR MINERAL ACIDS IN PAPER.

As a test for free mineral acids in paper, Congo red is useful if the quantity of acid be not too small, but in presence of alum, the reaction is apt to lose its sharpness, and may even be prevented altogether by the formation of aluminum compounds. Methyl violet and methyl orange are satisfactory, and by extracting the paper with hot water, minute quantities of free acids can be estimated with the last named indicator in presence of alum. In some recent experiments of filter paper, says O. Winkler, in the *Journal of the Society of Chemical Industry*, several samples of German "normal" writing paper and printing papers were tested; of these only the filter paper and one of the printing papers were perfectly free from acid; the others, like most resin-sized papers, contained traces.

In order to test the effect of free acid on paper, sheets were soaked in dilute solutions of sulphuric and hydrochloric acids, in strengths ranging from 1 per cent. to 1 in 50,000 and then dried, the subsequent observations extended over a period of three and a half years. After one month, the papers contained just as much acid as when freshly treated; subsequently the hydrochloric acids, especially in the highest dilutions, gradually disappeared to some extent, but the sulphuric acid remained practically constant all the time. Sulphuric acid was always more readily detectible with Congo red than hydrochloric acid, the latter in weaker proportions requiring methyl orange for its detection. The presence of free acid, even in very great dilution, acts injuriously on the paper, reducing its resistance to rubbing and creasing, as well as the hardness of the sizing. In the greatest dilutions, the deterioration was scarcely or not at all discernible, but this is merely a matter

of degree, depending on the lack of delicacy of the present methods of paper testing. Sulphuric acid acts more powerfully on paper than hydrochloric acid, hydrocellulose probably being formed. The acid is not used up in the process of decomposition, which it causes, but goes on acting continuously, probably until the paper is destroyed. Paper containing free acid is highly injurious as a wrapping or ground for color printed and metallic coated goods. Paper for this purpose should be free from wood and should either not be sized, colored, or bleached at all, or only very slightly; the pulp should not be beaten "wet," as cellulose so treated is more hygroscopic.

Mill Matters

The Norwegian steamer, *Protector*, with a load of pulpwood, from Chicoutimi to Cardiff, went ashore on Lark island, at the mouth of the Saguenay river, and sustained considerable damage.

Bentley & Jackson, paper machinery makers, of Bury, Eng., have turned out a paper machine which will make a finished sheet of paper 96 inches wide on a wire 45 feet long. It is said to be the largest machine for fine paper in England.

The capital of the Laurentide Pulp Company has been increased from one million six hundred thousand dollars to two million eight hundred thousand dollars, and the corporate name of the company changed from The Laurentide Pulp Company to The Laurentide Paper Company.

An accident occurred last month at the pulp mill at Sturgeon Falls, resulting in serious injury to two men. Mr. Lehr, foreman of the work of putting in the water-wheels and shafting, and Larry Power were on a scaffold, and when a bearing was being raised to the scaffold by a derrick, the whole lot of fixtures gave way. Power escaped with a broken leg, but Lehr sustained a double fracture

of one arm, had a leg broken, and received a number of cuts in the head and side. He has since died.

The British Columbia Official Gazette contains a notice of the incorporation of the Barclay Sound Pulp Co., with a capital of \$100,000. The company is given the usual powers under the joint stock companies' act.

John Fisher & Son, Dundas, Ont., have been incorporated, consisting of C. E. Fisher, of Dundas; R. C. Fisher, G. C. Campbell, John Lewis, G. W. P. Hood, of Toronto, to take over and carry on the business of John Fisher & Son, at Dundas, and to manufacture pulp, paper, cordage, twine and yarn. The capital of the company is \$200,000.

Nine hundred and ninety-three shares of the St. Croix Paper Co. have been sold for a price under \$3.50 per share to A. R. Coffin, of Truro. There is a mortgage of \$13,500 on the property, and in addition there is a bill of sale on the personalty for \$12,500. The capital stock of the company consists of 2,000 shares of a par value of \$100. The mill is on the St. Croix river, near Windsor.

A young man named Isidore Lecour was badly burned about the face at the pulp mill, L'Original, a few days ago. An apparatus for boiling lead was recently installed and Lecour thoughtlessly held a lighted match over the pot containing the lead, which was mixed with sulphuric acid, when the gas given off by the boiling metal exploded in his face. It is feared he may lose the sight of one or both eyes besides being permanently disfigured.

Archdeacon Holmes, Church of England missionary, at Lesser Slave Lake, who has just come from that region, states that there is some fine timber in stretches west of Lesser Slave Lake. One of these, about 12 by 15 miles in area, contains some very fine spruce, specimens being found eighty and ninety feet high. There is also a great deal of large poplar. Apparently, this country is more or less timbered to right up to the mouth of the Mackenzie river and the shores of the Arctic Ocean.

Strikes have prevailed in the paper trade at Holyoke, Niagara Falls, Watertown, and other places in the States during the past month, but the mill owners claim to be in a position to break the strike in each case.

Reports from London state that although the Harmsworths have been considering various propositions for the supply of pulp from Canada, Newfoundland and Scandinavia, they have made no purchase as yet, and that all reports of such a purchase having been made are premature.

The Sherbrooke Lumber Company, capital \$200,000, has been organized at Sherbrooke, Que. The chief incorporators are: H. M. Price, Quebec; O. C. Morrissette, Lake Megantic; B. Quinn, Windsor Mills; E. W. Tobin, M.P., Brompton; P. G. S. Mackenzie, M.P.P., Richmond; Dr. P. Pelletier, M.P.P., Sherbrooke.

A Manitoba charter has been granted to the Northwest Lumber and Commission Company. The applicants were Mary Jane Ashfield, spinster, of Ottawa, Ont.; Charles Bayley, agent; Joseph Carman, agent; John Campbell Kyle, manufacturer, and John William Brown, manager, all of Winnipeg. The objects of the company are to deal in lands and timber, "and to build and operate elevators, to carry on the business of the manufacture, purchase, and sale of logs, timber products, lumber, pulpwood, and pulp and to carry on the business of lumbering and pulp manufacturing in all their branches, and the making of improvements in the channels of rivers." The capital is \$20,000.

The work of installing machinery in J. R. Booth's new pulp mill, at the Chaudiere, Ottawa, is still going on. In the course of about four months the mill will be in operation. Mr. Booth has another site alongside, and it is understood that this is to be used for a paper mill. The new pulp mill has fifteen pulp grinders and an equal number of presses. When the mill is opened it will run night and day, and will employ a large number of men. The mill,

from the bush to the paper, will probably give employment to at least one thousand hands or more. There are fifteen large water wheels installed and these will furnish ample power.

So far as can be learned, the damage to spruce woods from the late forest fires will not be quite as serious as was feared last month. A large proportion of the burnt timber was only scorched, and the tree trunks can yet be used if men can only be got to cut them down and bring them to the mills before they are attacked by the white worm, which is apt to ravage scorched trees.

A report from Washington states that a study of the balsam will be carried on by the Bureau of Forestry this summer in the Adirondacks and in Maine. Work has already been done in the Adirondacks, and the object of the coming season's work will be to conclude the study. The results will probably be published next spring. The main purposes of the investigation of balsam are to determine its suitability for use as paper pulp, the quantity now standing, and the results that can be expected in the production of a second crop under conservative methods of lumbering. A study of the poplar in Maine has come about through the increased use of poplar as paper pulp material.

There has been much dissatisfaction among the members of the Loggers' Association of British Columbia at the action of the Provincial Government in throwing into the hands of the Island Power Co. so much timber land. As mentioned in last issue, this company was formed to take over certain concessions of pulp timber lands, and no more special licenses are apparently to be issued to loggers to cut timber on these lands. H. G. Ross, secretary of the Loggers' Association, thinks that under the terms of the act granting the concession, the new company can cut other timber than pulpwood by paying 2 cents an acre and the royalty only (50 cents a thousand feet.) Another timber man thinks the company will not have power to cut wood, except for pulp purposes,

but that the effect will be to tie up the timber for a term of years, and that the company and not the Government will get the benefit of the increase in value. The report adds: On Vancouver Island thirty square miles is being held by a company and six licenses, on which \$600 were paid, in this big concession are not to be renewed as they are in the belt reserved by the Government. It is claimed special licenses will be treated in the same way in the present big concession. There are some things that the order-in-council will do that cannot be disputed. It will deprive the Government of an enormous revenue, prevent any more licenses being issued, kill the hand logging industry, still further shake the confidence of the intending purchaser in the British Columbia laws, increase the price limits and check speculation in timber.

In an interview with the Montreal Star, the Hon. J. D. Rolland, of the Rolland Paper Co., and president of the paper mills at St. Jerome, is high in his praises of the prospects of Northern Quebec as a timber and agricultural country. Senator Rolland is president of the North Colonization Railway of Quebec, which is now in course of construction northward from Labelle. It is a well timbered region and is being rapidly settled. Speaking of the progress and prospects of the districts he said: Annunciation is a thriving little town. In January last the population was 1,200 but on the first of July it was 1,800. The operations on the railroad and the increase in the lumber business had produced this remarkable growth. The company expects to continue its road thirty miles further north, from Nomingue to L'Orignal rapids on the Lievre river, where there is already a very progressive little village. In all this northern section there is the very finest soil in the Dominion. Though not yet cleared, it is in every way equal to the soil to be found in Manitoba. Water power is also to be found here in abundance, and this fact has possibly conspired to stimulate the lumbering trade in that section as largely as has been the case. In fact, we

are adding another province to the Dominion."

The North River Pulp and Lumber Company intend to do a large amount of timber shipping during the present summer. They anticipate the arrival of a large three-master within a few days for another load of pulp wood.

The water-wheels that are installed in the Montrose Paper Company, at Thorold, Ont., are made by the Jenckes Machine Company, Sherbrooke, Que. They are 40-in. twin wheels, set up on twenty-two-foot girders, and have a capacity of 300 horse-power under twelve feet of head. They are connected directly with the main shaft. In each wheel case are twelve gates. The escape is made by a draught tube eight feet in diameter. The water is admitted by a ten-foot oval feed pipe. The same type of wheel is being installed in the Booth pulp and paper mills at Ottawa.

It has been discovered that the foundations of a part of the big power plant of the Consolidated Lake Superior Company at Sault Ste. Marie (of which the Sault Ste. Marie Pulp and Paper Mills are a department) has been undermined. The directors declare it an unimportant matter that already has been repaired, and in a month or six weeks water will again be turned on the canal. When water was turned on it was noticed that the St. Mary's river, where the canal empties, was muddy, when it should have been clear. The basin was at once emptied and it was found that the earth under the foundation of a section of the building had been washed entirely away. There were quicksands, but the damage was principally due to the old water course, which the pressure of the water in the canal re-opened.

Evidence was taken at New York last month before the Board of Classification in the case of the countervailing duty on pulp imported into the U. S. from the Province of Quebec. The following witnesses from Canadian mills were examined on behalf of the importers: Francis H. Russell, Laurentide Pulp Company; George E. Challes, Riordan Paper Mills; Francis P. Buck, Royal Paper Mills Com-

pany; Alexander O. Anderson, the Jas. McLaren Company; Willard N. Munroe, Brompton Pulp and Paper Company; and John R. Meyers, of Meyers & Co., Rouse's Point. Henry J. Cookingham, of Cookingham & Shesman, Utica, N.Y., attorneys for Meyers & Co., representing most of these mills, argued that the pulp wood in question was in part cut from private lands, and in part from Crown Lands, and as such should not be subjected to the countervailing duty, but the Government counsel, Albert H. Washburn, maintained that where the pulp wood was so mixed it should be all assessed.



PERSONAL.

Arthur E. Wright, manager of the New York division of the sales department of the International Paper Co. has been appointed secretary of the American Paper and Pulp Association. His address is 30 Broad St., New York.

Alexander McArthur, youngest son of the late Colin McArthur, of Cote St. Paul, and head of the firm of Alexander McArthur & Co., the well known firm of wholesale paper dealers of Montreal, died suddenly a few days ago. The Witness says: "Mr. McArthur had been suffering for a few days from what was thought to be only a cold, but serious symptoms developed and blood poisoning set in with a fatal termination. He was possessed of a robust constitution and had the best medical attendance. He was a man of high integrity, successful in business, affable in manner, happy in disposition and popular with those among whom he moved. A widow and two daughters survive. Deceased was a brother of Colonel Colin McArthur, manager of the Montreal wall paper factory at Hochelaga."

Ernest A. Bremner, whose death in London, Eng., occurred last month, was well known in connection with the Sturgeon Falls Pulp and Paper Co., which he organized. He obtained a valuable concession from the Ontario Government, sold it to the Lloyds of London. (Eng.), publishers of The Daily Chronicle. A

dispute which arose over the amount of waterpower and spruce timber in the concession was referred to arbitration, which decided against the Lloyds, awarding the company \$500,000 damages, a further sum of \$150,000 in connection with the bonds and charged costs of \$35,000, against the Lloyds. The company was then reorganized under the name of the Imperial Paper Mills of Canada. Mr. Bremner was born in England but came to Canada when very young. While studying at the University of Toronto, he became interested in the Salvation Army, and he afterwards went to England where he was intrusted with the task of putting the Army's finances into proper shape. This he did to the satisfaction of the Army, and the ability he showed won the confidence of a number of London's great capitalists, who backed him in the Sturgeon Falls Company. Mr. Bremner was about 40 years of age and unmarried. His father and mother still live at Minesing, near Barrie.



THE USE OF WOOD FIBRE FOR PLASTER.

One of the uses to which wood fibre is now applied is in the manufacture of plaster. The Imperial Plaster Co., established in Toronto about two years ago, is, under the patents of J. W. Auld, its vice-president and superintendent, manufacturing a kind of plaster into which wood fibre enters largely. Basswood, elm and poplar logs are cut up into fibre—spruce is of no use for this purpose—and the fibre is then mixed with sand, plaster of paris and a small proportion of hydrate of lime. This makes a very hard and strong plaster. For outside work Portland Cement takes the place of plaster of paris. The Imperial Co. grind and prepare their own plaster of paris from the rock, and manufacture their own hydrate of lime, besides supplying a considerable amount of the latter to paper makers. The King Edward hotel is finished throughout with this wood fibre plaster, which is now being largely used and possesses very marked advantages

Another process of wood plaster is carried out at Bellows Falls, Vermont, by the Bellows Falls Plaster Co., of which G. F. Hendee is president and A. T. Pierce, secretary-treasurer. The process is described as follows: The ingredients, with the exception of wood fibre, are brought from other points, ready to mix. The wood fibre is prepared there. Green logs are put on to a machine, which grinds off the fibre, and this fibre is carried to the second floor, where it goes five times through a 50-foot dryer. A fan blows hot air into this dryer and, after travelling 250 feet, the fibre comes out thoroughly dried. The ingredients in the proper proportions are thrown into a mixer and in twenty minutes the plaster is ready to put into bags and ship. These bags contain eighty pounds each, twenty-five making a ton. The local plant has a capacity of thirty tons per day.



The Consolidated Lake Superior Co., which owns what are known as the Clergue enterprises at Sault Ste. Marie, is apparently not making much headway with its financial reorganization. The stockholders are now being asked to give \$75,000,000 cash for \$12,500,000 bonds, which would provide the means to pay off the loan of some \$5,000,000 made by a New York syndicate some time ago, for which it holds as security a mortgage on all the company's property, and furnish a working capital. Failing this, it is expected the whole business will have to pass into the hands of a receiver. There seems some prospect also that some of the lesser enterprises will be cut off. It is not likely the pulp works will be one of these, though according to a statement issued by Cornelius Shields, the new president, the Sault Ste. Marie Pulp & Paper Co. has been losing money heavily, due largely to experimenting.



GOOD WORDS.

We note the appearance of a new monthly, entitled the Pulp and Paper Magazine of Canada, published by Big-

gar-Samuel, Limited, Montreal and Toronto. It is an intelligently edited journal, clearly printed, and it appears to have, in the pulp and paper business, a field for usefulness and growth.—Manitoba Free Press, Winnipeg.

We are in receipt of the first two issues of the Pulp and Paper Magazine of Montreal and Toronto and welcome this addition to the ranks of Canadian technical journals. The numbers before us contain many excellent features covering a great range of matters directly of interest to those whose attention is being devoted to wood pulp and paper manufacture. If the journal can succeed in building up the paper making industry in Canada to a position it is intended to occupy by reason of its enormous tracts of forests it will have the cordial support of all. The shipping of pulp is but a negative form of development, for it seems foolish to say the least that we should continue to send out immense quantities of pulp every year and reimport it in shape of paper, when these operations should be conducted in this country. This is a worthy subject for the attention of the above magazine.—Industrial Advocate, Halifax.

I consider the Magazine a credit to you both in appearance and in the character of its contents. Hope it may prove a decided success. Yours sincerely,

J. Laverock, Hamilton, Ont.

—In the year 1899, an officer of the British army in India obtained a number of ancient manuscripts from the province of Cashgar, in Eastern Turkestan. These date from the fifth century, and are considerably older than any Indian writings that were known before. Microscopic examination showed that they were made partly from rags and partly from raw fibres. The available evidence seems to point to the fact that the art of making paper from rags was first discovered by the Chinese early in the Christian era, and was transmitted from them through Central Asia to the Arabs, who in turn instructed the Europeans in this manu-

facture. The old idea that rag paper was first invented in the Middle Ages must therefore be corrected.—Chemiker Zeitung.



—The United States Consul at Yokohama states that more than half the fancy glazed paper, match paper, and packing paper imported into Japan comes from Germany, the United States doing very little in these lines. Great Britain leads in printing paper, with the United States and Austria-Hungary not far behind, the three together furnishing more than three-fourths of the entire importation. There are eleven paper mills in Japan, and they are steadily increasing their output, which last year amounted to 103,926,000 pounds; while the total importation, which was less than half as much as in 1901, was 17,359,000 pounds. The native factories have formed an alliance to control prices, with a view to checking sharp fluctuations. They do not produce ornamental paper, but manufacture printing paper, boards, and wrapping paper. The U. S. Consul at Kobe says that paper making machinery is a class of machinery the demand for which from the United States has grown since 1899, when \$16,198 worth was imported, to \$162,596 the following year, and \$125,467 in 1901. The uses of paper in Japan are many, but on account of the rapid increase of newspapers there it is thought the demand for printing paper has advanced more largely than that for manufacturing paper. Paper required for the latter use is mostly made by hand in the homes of thousands of people, and is of a rough texture, while that used for printing purposes is largely manufactured in mills requiring modern imported machinery, and the growing demand for such machinery should be carefully noted by American exporters.



—The Pulp and Paper Magazine of Canada is a new trade magazine, published at Toronto, and judging from the first number, will contain many articles of interest.—Forestry Quarterly.

STRAW AND ESPARTO BOILING.

After a series of trials on a commercial scale, Mr. Schacht has introduced a new process for boiling straw and esparto into two large German mills, and also uses it himself in a mill of which he has become co-proprietor. The Weissenfels mills turn out twenty tons of straw pulp a day, made by Schacht's process by treating the raw material with neutral monosulphite of soda. By this improved process the inventor has obtained a yield of 52 per cent. to 54 per cent. from rye and wheat straw, and a yield of 60 per cent. from esparto.

In his treatise on papermaking, Hofmann says that the physical and chemical treatments of vegetable cells destroy not only the substances which enclose them but also along with them a large proportion of the cellulose, which he estimates at 40 per cent. and more, and at 10 per cent. where alkalies are employed. Various authors give the yield of wood treated by soda, or sulphate of soda, as 28 per cent. to 38 per cent. of raw pulp, which bleaching reduces 10 per cent. to 12 per cent., although, according to many scientists, wood contains from 60 per cent. to 80 per cent. of cellulose. If this theoretical yield of the laboratory cannot be obtained in practice, it is certainly, nevertheless, not impossible to more closely approach it than we can by the reagents at present employed, and which dissolve and destroy a certain proportion of the cellulose. The same thing is true of the treatment of straw according to its nature and the method of boiling; treatment with alkalies reduces the yield from rye and wheat straw to 38 per cent. to 48 per cent., although competent authors showed as far back as 1869 and 1876 a cellulose content of 47 per cent. to 54 per cent. It is true that at that time the existence of the secondary celluloses, the molecules of which are considerably larger than those of cellulose itself, was not known, and that chemical science was not armed with adequate means to enable it to arrive at an exact determination of the composition of vegetable substances.

The choice of seed and methods of culture have had, however, the effect of increasing the cellulose in straw. This question will doubtless be solved shortly by agricultural chemists occupied at the present time in scientific research, with the object of determining the chemical composition of different kinds of vegetable matter. The kinds of straw which can be employed for the production of pulp contain 56 per cent. to 70 per cent. of cellulose and secondary cellulose, which are not by any means utilized in the way the manufacture is carried out at the present day. It is therefore important to study the chemical phenomena arising during the soda or sodium sulphate methods of boiling, to avoid as much as possible strongly caustic liquors so as to reduce loss, and to use less alkaline or even neutral liquors, yet employing as far as possible existing plants and machinery. By diminishing the quantities of substances dissolved in the residues from the liquors, those mills which recover the salts by evaporation will simplify at the same time the regeneration of the alkalies and also suppress to a large extent the offensive odors produced by the soda or sodium sulphite; the use of the latter compound causes endless nuisance by the offensive odors which it spreads over the neighborhood. It is probable that the excess of the alkaline sulphate decomposes a quantity of the cellulose dissolved by the excess caustic soda, and which passes into the residues as hydrocellulose and oxycellulose; various organic bases are thus formed which are very volatile and possessed of an excessively penetrating odor. There are also produced as well sulphurous organic substances when the quantity of dissolved cellulose is large and the solutions are subjected to the action of a very large quantity of sodium sulphate. Hence the difficulties which beset those pulp mills which employ these liquors, difficulties which are justly resented by the neighboring population. Experience has shown that these residues from the sodium sulphate liquors, even when strongly concentrated, do not contain dissolved cellulose or secondary

cellulose, nor do they emit any disagreeable smell. Pulp treated by soda or sulphite, moreover, has the disadvantage of turning yellow and also ferments readily, probably owing to the tendency of the cellulose to oxydize, which renders it unfit for the manufacture of explosives, or produces fresh losses owing to the cellulose decomposing and the products escaping in the form of gas. The author of this new process has, however, succeeded in finding in sodium monosulphite a liquor for vegetable fibres which obviates all the inconveniences of soda liquor above mentioned, and which can be applied to all existing plants in mills employing the old process. Sodium monosulphite is neutral, and when the liquor is used under pressure, completely dissolves all the matter which encrusts the cellulose without attacking the cellulose itself; those experiments which were first tried on a small scale and subsequently on a manufacturing scale have yielded 15 per cent. to 20 per cent. more cellulose than the old methods. The pulp obtained is clean, solid, and readily divisible; it bleaches with a very small quantity of chlorine, does not turn yellow or ferment, and is extremely supple and felts well on the machine. It possesses, therefore, besides the advantages of soda pulp, all those of bisulphite pulp. One great advantage of the new process is the suppression of the bad odors which are produced when making sulphate or soda pulp and recovering these products. The pulp and residues only produce a very small amount of smell, which is rather aromatic than disagreeable. The production of the new liquor consists in passing sulphurous acid gas into a solution of soda or recovered soda, until the whole of the caustic soda, the sodium sulphide, sodium silicate, and part of the sodium carbonate are converted into neutral bisulphite and sulphite of soda. The remainder of the sodium carbonate is then causticized by the addition of lime. The liquors may also be prepared by passing sulphurous acid into solutions of caustic soda, or by preparing the sulphite and soda liquors separately and mixing them afterwards.

The new liquors for manufacturing cellulose must always be alkaline, but only contain the quantity of caustic soda necessary to dissolve the silicates and aluminates in the raw materials. These new solutions only contain the principal chemical elements of the old liquors incidentally, and these are often not present at all, but there is always present in predominant quantities neutral sulphite with a small proportion of sodium bisulphite.—Le Papier.



ACADIA PULP AND PAPER MILLS.

The Acadia Pulp and Paper Mills Co., Limited, of Halifax, has issued a notice to the creditors that the business will be liquidated. The company was incorporated in 1897 with a capital of \$550,000. It then acquired the property of the Milton Pulp Co. and the Morgan Falls Pulp Co.

The causes that have led to the liquidation are explained in a recent special report submitted to the shareholders on the operations of 1902:

The directors deeply regret to have to report that the operations for the year do not show any profit, but have resulted in a loss of \$8,550.59, as compared with the gross profit of \$21,611.83 per the previous year. To this loss must be added the amounts paid during the year to the trustees for the bondholders, rent and salaries at head office, bonds paid off and premium thereon, bond and other interest, the preferred stock dividend, a few small charges, and the sum of \$9,681.71, which it has been found necessary to write off for loss on pulpwood, amounting in all to \$30,668.98, making the total at the debit of profit and loss account for the year's operations, after deducting the sum of \$274.22, the amount brought forward from last year, \$38,945.35.

This unfortunate result has been mainly due to the increased cost of pulpwood, the higher cost of manufacturing, and the lower prices received during 1902. During the past few years the cost of pulpwood has been gradually advancing. The cost of manufacturing this year

has also been greater than in previous years, due largely to the increased cost of labor. The management also found great difficulty in procuring satisfactory labor, owing apparently to the general increased demand for labor throughout the country. Heavy expenditures had also to be made in repairing the damage done to the company's dams and property caused by the unprecedented spring freshets. These freshets operated in two ways, as not only had the damage they caused to be repaired, but during their continuance the production of the mills was largely reduced, and as the company also had once more to contend with summer drought these combined circumstances all tended to increase the cost of production. The lower prices received for the company's products were due to market conditions, and to the fact that during the continuance of the freshets above referred to, a pulp of a poor grade only could be produced, which had to be marketed at reduced rates.

During 1902 the Mersey Hydraulic Co. completed a dam on the Liverpool river, which it is confidently hoped will in the future insure an even flow of water throughout the year, thus enabling the mills on this river to be operated during the future dry months. Your directors fully realize that the situation which has to be faced is a very serious one, and have been giving it their most careful consideration with a view of finding a remedy for the present unfortunate state of affairs. A large quantity of pulpwood has always been kept on hand, and at this season of the year it has generally been sufficient, as it is at present, to run the mills for about 12 to 16 months. With such a large stock of wood on hand, the mills must be kept running in order to work it up, as it would seriously deteriorate in value if allowed to stand. It will be unnecessary to order any wood for future operations of the company on the Liverpool river before September, 1903.

Your directors, therefore, recommend that the mills be vigorously run until

September next, and they hope by that time that the board will be in a position to decide upon the best course to be pursued in the interests of the shareholders. In the meantime the very best efforts are being made to find a remedy for the present condition of affairs, and every possible economy is being practised. It has been arranged that for the present the managing director should reside at the mills at Milton, so that a closer supervision may be given every detail of the business, and the manager there may have the benefit of his advice. All the mills of the company are now in operation, and their efficiency has been fully maintained. Of the issue of \$100,000 of preferred stock, which was proposed in the last report, \$82,500 has been taken up and fully paid for. The directors have transferred \$17,250 from the reserve fund to the credit of the profit and loss account, making the balance at the debit of the profit and loss account on the 31st of December last \$21,695.35.

The report, which appears to be a frank, fair statement, was signed by Walter C. Jones, and was accompanied by the following financial statement for the year ending December 31st, 1902.

Liabilities.

Capital—

Preferred stock	\$250,000 00
Common stock	550,000 00
Debtenture bonds, \$100,000, less	
15 bonds paid off, \$15,000...	85,000 00
Sinking fund for bond redemption	15,000 00
Current Liabilities—	
Bills payable	51,056 82
Sundry creditors	18,775 31
Interest on bonds to December 31st, 1902	2,550 00

\$972,382 13

Assets.

Real estate, mills, machinery, timber lands, dwellings, water power, barges	\$768,055 23
Inventories (merchandise at mills and stores)	27,336 84

LABOR IN THE PULP TRADE.

Manufactured pulp	18,760 90
Pulp wood	42,528 36
Sundry debtors	21,154 30
Cash in bank and on hand....	1,851 15
Treasury stock	67,500 00
Mersey Hydraulic Co. stock.	3,500 00
Profit and loss	21,695 35
	<hr/>
	\$972,382 13

Profit and Loss.

Dr.

To trustees' bondholders.....	\$ 865 00
Rents and salaries at head office	4,000 00
Stationery, postage and cablegrams	625 35
Interest	2,517 94
Legal expenses	237 61
Premium on bonds paid off....	150 00
Bonds paid off	3,000 00
Fee to increase capital	100 00
Fee to amend act to incorporate	4 50
Auditor's fee	150 00
Bond interest to June 30th, 1902	2,640 00
Bond interest to December 31st, 1902	2,550 00
Preferred stock dividend to June 30th, 1902 (six months).	4,146 87
Loss operating mills, less profit on stores	8,550 59
Loss on wood at Milton.....	8,706 71
Loss on wood at New Germany	975 00
	<hr/>
	\$39,219 57

Profit and Loss.

Cr.

By balance, Jan. 1st, 1902	\$ 274 22
Transfer from reserve	17,250 00
	<hr/>
	\$17,524 22
Balance	21,695 35
	<hr/>
	\$39,219 57

It would appear that in view of the present condition of the pulp market, it was deemed best to wind up the company.

A correspondent of The Paper Mill, of New York, comments as follows on the labor question as affecting the pulp trade in Canada:—A Canadian, who is connected with the paper trade, remarked that in one of the communications which The Paper Mill printed from Lord Strathcona's report, \$3 per cord is quoted as the price at which pulp wood can be got in this country. He would like to know where it can be had at that figure. That there is abundance of spruce and woods suitable for making into pulp he does not deny, but, he says, you must have something more than the raw material in the growing tree before you can have finished product ready for exportation. To say nothing of the need for more railways to reach the spruce belt, there is the element of labor to be considered. If there were millions of acres of the finest spruce growing right up to the edge of the Lakes and of the St. Lawrence, it is doubtful if, at the present time, you could lay it down at a convenient pulp mill for \$3 a cord. Labor is extremely scarce, and though that of the shanties is not of the most skilled order, yet it is of a sufficiently special character not to be capable of increasing instantly in response to a sudden expansion of the demand. That is to say, while there might be plenty of able-bodied men available, only such of them as had previous experience in the woods would be of high efficiency there. But there is now a shortage of men of any labor capacity whatever, and during the last winter pulp manufacturers and lumber cutters had to pay wages from 50 to 100 per cent. above those current six or seven years ago, and then had to take such hands as they could get. A few years ago, when labor was plentiful, the working man advanced in years was not wanted. But the oldest laborer who has any fitness is wanted at good wages now. At all events, the wages cost of pulpwood has greatly increased, and it would be hard, my informant thinks, to get pulp wood laid down at \$3 a cord. As a matter of fact, the labor question is becoming

ing a serious one in Canada. There are many small strikes at the present moment, but even if there were the utmost smoothness of relations between employers and employed, the labor situation would be unsatisfactory. The truth is, the mechanical productive capacity has outgrown the human productive capacity of the country. It looks almost as if the development here were somewhat lopsided, as if the agricultural activities absorbed more men than the manufacturing activities. Canada has opened and is settling and cultivating its northwest at a rapid gait. Increasing crops there and fair prices for wheat have given the West a spending power that keeps the factories of the East busy, and the latter cannot get hands enough to keep their works going up to the full limits of the demand. If there were more labor available there would be a considerable extension of works. New works would be put up and old ones would be enlarged. But the scarcity of labor is a bar to this development. This state of affairs has set the manufacturers thinking upon a remedy. They have concluded that the immigration heretofore encouraged by the Government has been too largely for the settling of the agricultural lands. They have accordingly resolved to ask that more attention be given to the bringing of skilled mechanics into the country.

ANIMAL SIZE.

Owing to its extensive use in coating paper and the allied branches of the trade, animal size, gelatine or glue is often an object of grave suspicion as to quality, and were it only possible to formulate a simple practical test for quality and suitability for mixing with the various ingredients and colors, etc., it is intended to be worked with the same, would be highly acceptable. As a matter of fact, the testing of glue and similar colloid bodies is quite a difficult operation even for the skilled analytical chemist, and unfortunately the figures obtained, even by the methods of testing recognized as standard, are generally

more or less open to question. The first thing to be borne in mind in this connection is that the name of the glue is absolutely no criterion of its value for any given purpose; and to a great extent the same may be said of the price. Rabbit pelt glue, Cologne glue, Russian fish glue, unbleached scale, etc., as a rule are only figments of the imagination, just like many of the fancy names given to aniline colors.

There are two main divisions in glues, for practical purposes at least, as far as the paper and coating and allied branches are concerned—the glue made from skins, fish sounds and other non-ossified animal matter, and secondly the glue made from bones—often called “patent glue,” instead of by its proper name, “bone size,” and that mostly to conceal its true nature. In the former class go almost all the better grades of glue and size (animal), no matter what their trade name may be, and in the much more extensive latter class come a great many sizes of low grade and valueless or positively injurious for some purposes, either owing to want of sizing power or else to the presence of accidental impurities or purposely added foreign matter. It is quite true that for some purposes a well-made bone size gives satisfactory results, which can hardly be improved on by using a much more expensive material, but it is equally true that unless found by careful comparative or practical trials to be suitable for the purpose intended, so-called patent or bone sizes are, with perfect justice, generally deemed capable of standing considerable watching by the experienced chemist and color mixer.

It is customary to judge solid glues and adhesive compounds by transparency, but this is highly fallacious, as a process is now in use for bleaching animal sizes with chlorine, which not only improves the color but also yields a product which is much more transparent than untreated stock. This bleaching process not only impairs the sizing and adhesive properties of the glue, but many colors, both aniline and pigments, are sensibly affected by such

glue. A well-made patent glue or bone size is usually beautifully clear and almost glassy in its transparency, and this in itself, especially at a low price, is suspicious to the experienced eye. A certain grade of animal or bone size used to be made by boiling bones with water at low pressure, and was quite suitable for many purposes, but most of the stuff now sold is made by treating the bones first with a solvent to extract the grease, then with muriatic acid to remove the phosphate of lime, and finally with high-pressure steam to make the size soluble irrespective of impairing its sizing power.

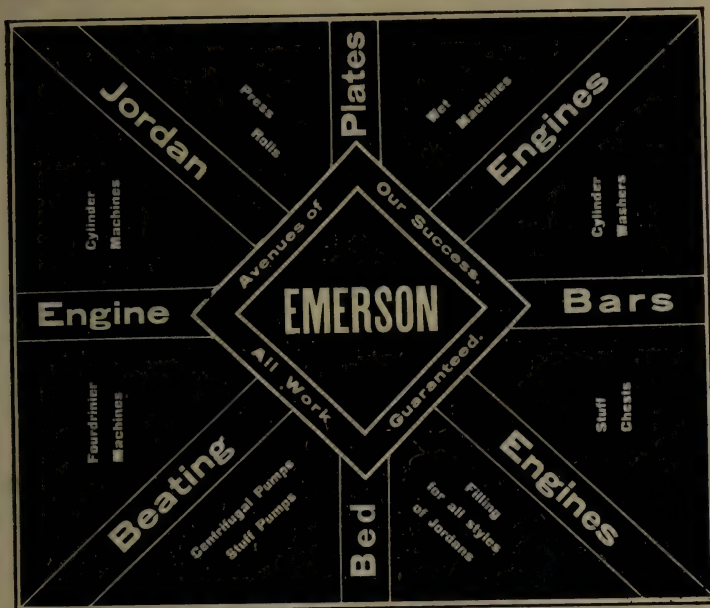
Such size is quite liable to almost destroy some sensitive colors and perceptibly change the shade of others. Where much coloring matter is used with glue, it is a good plan to keep a quantity on hand of a glue which has been found by practical trial to have all desired properties and no injurious action on color or any other ingredient it is liable to be worked with. By making a comparative trial, using the new glue for one mixture and the standard for another, and exposing both mixtures coated on paper or otherwise applied to the same conditions, during the time of test unpleasant contretemps may be avoided which are costly in time, money, and temper, which, after all, has a money value also.

As a general rule, the glue that will take up the most water to form a tough jelly and yet not dissolve is the best in adhesive power and in many ways goes the farthest, but this is not absolute, and better tests must be used for certainty. Comparative trials are probably the safest in this as in many other cases. However, as a generally and fairly safe guide for glues, only of the same class, the test by water absorption may be used in default of a more accurate one, and is a good deal better than no test at all. There are a great many interesting points connected with the technic and chemistry of glue and its industrial applications, but a synopsis of these must find place in another article.—H. R. in Paper Trade Journal.

SULPHITE PULP PROCESS.

Viggo Drewsen, of New York, has got a United States patent for a new process of making wood pulp. Of his claims he says: "It is known to those skilled in the art, that when wood is cooked in the bisulphite liquor the liquor must penetrate the wood thoroughly before the temperature of the contents of the digester is raised above the boiling point of water. If the wood chips are not thoroughly permeated by the liquor, the sulphurous gas and the steam in the digester will cause the incrusting or non-fibrous material to turn brown, and thus produce spots in the pulp. The object of my invention is to cure this defect. The ideal method would be to exhaust the air from the digester containing the wood and then force the cooking liquor into the wood under pressure before the steam is admitted to the contents of the digester; but this method of producing a vacuum and the use of pressure is too expensive for practical use. I have found that practically the same result can be obtained if the wood chips are dipped into a suitable liquor at ordinary temperatures and stored in the bins before the wood is introduced into the digester. It would not be practical, however, to use the ordinary bisulphite of lime liquor for this purpose, because the odor of the sulphurous acid is too strong and offensive and because the acid liquor destroys the material of which the bins are composed. My invention consists in the discovery that I can obtain the desired result by soaking the wood chips prior to their introduction into the digester and the ordinary cooking liquor in a solution of a monosulphite which is soluble in water, such as Na_2SO_3 , MgSO_3 , etc. The water solution of the monosulphite is neutral, or slightly alkaline, has no odor, and does not attack the material composing the bins. The strength of the solution may, of course, be varied, but I have found that a solution of four parts of sodium sulphite ($\text{Na}_2\text{SO}_3 \cdot 7\text{aq}$) to one hundred parts of water is efficient."

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Paper Anilines

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Send for Color Cards and Prices.

PULP MARKET.

Summer conditions now prevail in the pulp market, and trade is quiet. The heavy rains of June have had the effect of bringing down the price of pulp. Canadian ground wood pulp is now quoted at \$18 per ton, delivered at New England points, and \$19 to \$20 delivered at mills in Ohio, Michigan, Wisconsin, and Indiana. Sulphite pulp is from \$1.85 to \$1.95 per cwt. in New England and the West. Prices paid for Canadian pulp-wood run from \$5.25 to \$5.75 per cord, f.o.b., cars at eastern and western points.

Reports from Scandinavia speak of continued depression, not only in the mechanical pulp export trade, but in that of sulphite pulp. Hopes for better prices were based on the reports of forest fires and drought in Canada and the United States, but of course the recent extensive rains have dampened these hopes.



PAPER STOCK MARKET.

Montreal, July 11th, 1903.

The demand for the better qualities of paper stock, especially new cuttings, continues good. Blues and thirds and domestic cottons are still scarce. Roofing and wrapping stock is in full supply, and prices easier. Manilla rope is slightly lower, and local collections still moving with United States mills. Bagging is a drag.

There is still a good demand for waste paper, especially for the lower qualities. White and colored shavings are closely bought up. In spite of the low average

value of rags, collections through the country appear to be quite large. Such collections are usually stimulated by high prices or by hard times, but as neither of these causes appear to be acting at present, the large collection of this year is difficult to account for.

We quote wholesale dealers' selling prices:

Domestic white rags,	\$2.25 to \$2.35	per 100
Blues and thirds	1.25 to 1.35	" "
Dark cottons	75 to 90	" "
Roofing paper stock . . .	45 to 50	" "
Waste papers	40 to 50	" "
Hard white shavings . . .	2.00 to 2.10	" "
Soft white shavings . . .	1.25 to 1.50	" "
Book stock	60 to 80	" "
Manilla rope	2.30 to 2.40	" "
Mixed bagging	60 to 70	" "
Sisal and jute string . .	75 to 1.00	" "
Flax tow	1.10 to 1.25	" "



—On the initiative of the Lord Mayor of Sheffield, Eng., the council of that city recently passed a resolution in favor of the adoption of the metric weights and measures throughout the British Empire. Copies of this resolution were forwarded from Sheffield to over 400 town and county councils. Many of them have acted on the suggestion, and after passing the resolution have notified the Board of Trade and the members of Parliament representing their division. A Decimal Association exists in England whose object is to agitate this question. Many manufacturers and exporters are members. The address of the Decimal Association is Botolph House, Eastcheap, London,

Machinery For Sale.

2 Jordan Engines, in good order; 1 Stack, 39 in., super calenders, in store; 1 Sheet Cutter; 1 Rotary Boiler, 8 ft. x 24 ft., in perfect order; 1 Roll Grinder, will grind rolls 24 in. dia. x 124 in. face, in perfect order; 1 23 in. Leffell Water Wheel, complete; 1 40 in. do., some parts missing; 6 Return Tubular Boilers, 100 H.P., insured at 100 lbs. pressure; 2 Horizontal Slide Valve Engines.

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ANGOULEME (France) ..	43 Rue Louis Desbrandes.
LYONS	54, Cours Gambetta.
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Sal. soda	0 75 to 0 90
Caustic soda, 60°	2 00 to 2 25
Caustic soda, 70°	2 35 to 2 50
Alum	1 25 to 1 50
Copperas	0 65 to 0 75
Sulphur rock	1 25 to 1 50
White sugar of lead	0 07 to 0 08
Bich. potash	0 06 to 0 07
Soda ash, 48° to 58°	1 15 to 1 25



ON THE LINE OF THE TRANS-CANADA.

In an interview with the Toronto Globe, Vaughan M. Roberts, civil engineer, who was at the head of a party surveying over the route of the projected Trans-Canada Railway, told of the great resources of Northern Ontario in waterpowers, pulp timber and minerals. These resources appear to be equal to those of Northern Quebec. The Abitibi river, for instance, which at a distance of a hundred miles from its junction with the Moose averages four hundred feet in width, contains numbers of magnificent waterpowers, awaiting development, varying from 15,000 to 150,000 h.p. each. The banks of the river are lined with the best of pulpwood of all descriptions, which is practically valueless, however, until it is made available by the construction of a railway into the territory. All this immense territory, with its enormous natural products, will be tributary to the Trans-Canada Railway, whose mission it will be to develop it. It is, at present, its only hope. The tributaries of the Moose river possess powers equally good, if not better, than those of the Abitibi. There is one alone on the Missanabie, not far from the proposed crossing of the river by the railway, which is capable of developing at least a quarter of a million horse-power. Above this fall there are three others within a distance of four miles, having altogether a fall of about 300 feet, capable of furnishing fully half a million horse-power. Apart from its great

wealth of timber and pulpwood, there is much excellent agricultural land in this north country, and indications of very great mineral wealth. Mr. Roberts says that there are a number of smaller rivers flowing into the large tributaries of the Moose, already mentioned, from the east, which also furnish splendid waterpowers. He reports that the general features of the country are level, affording splendid opportunities for comparatively easy railway construction. It is also possible to obtain very easy crossings of the river for a railway. In some localities they spread out into shallows which may be waded. At others they contract at waterfalls into very small space, and are often divided into two or more streams by rocks or islands.



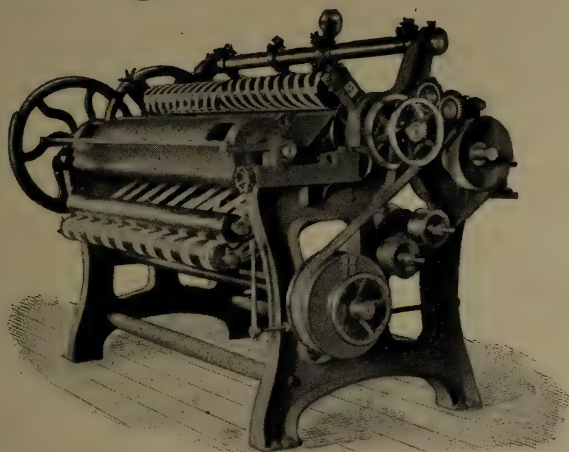
—Hon. James Dunsmuir, of Victoria; C. H. Cobb, James Campbell, Rufus H. Smith, of Seattle, and Frank Brownell, of Everett, have bought 50,000 acres of timber land on Vancouver Island for which they paid about \$1,000,000.

—The Ekman Pulp and Paper Co. of Northfleet, Eng., founded by Mr. Ekman, the original inventor of the sulphite process, has given up the manufacture of sulphite pulp, having found it cheaper to buy pulp in the market than to make it. The closing down of the works, by which several hundred hands were thrown out of work, was hastened by a law suit brought by the owners of adjacent land which was injured by being soaked with the waste liquors from the mill.

—In a report on experiments in tree planting at the Experimental Farm, at Ottawa, Prof. Saunders says: The white spruce makes the most rapid growth on warm, sandy loam soil at Ottawa. It does well on gravelly soil and fairly well on clay loam. The Norway spruce, which is the fastest growing spruce we have, makes its greatest growth in good, sandy loam. It also succeeds well on gravelly soil and clay loam; in fact, it has made good growth in all kinds of soil in which it has been tested, but makes the poorest growth in the lightest sandy loam.

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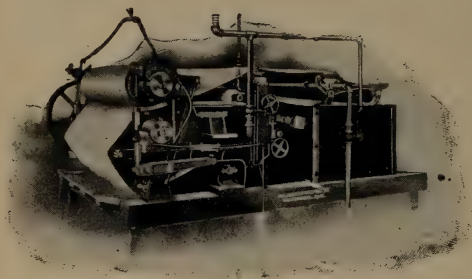
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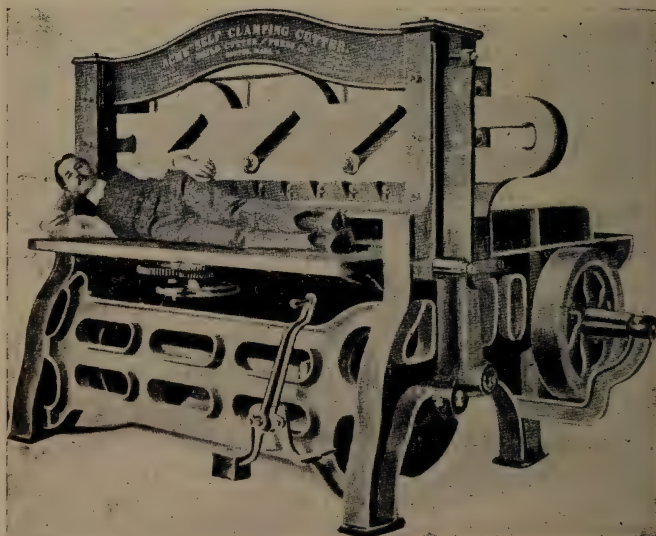
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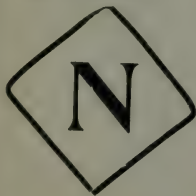
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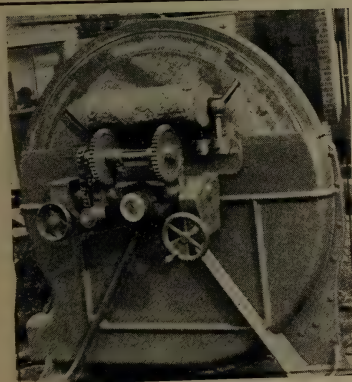
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Interested parties are referred to Vol. 1, No. 1, of this magazine for interesting details regarding this screen, which will be found in a short article describing the screen and its work.

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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 4.

TORONTO, AUGUST, 1903.

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SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

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THE FOUNDATION OF THE PULP AND PAPER TRADE.

At the base of the wood pulp and paper industry is the question of the preservation of the forests. Without ample supplies of pulpwood of good quality, conveniently situated both as to water power and water transportation facilities, the pulp and paper industries, as conducted on this continent, would soon languish. This is a fact that is now painfully realized in some parts of the United States, but it is not yet realized in Canada, by public men who have the direction of our crown lands domains, or indeed by many who are directly interested in the pulp trade. There are two causes of this ignorance. First, the uses to which land has been put during

the past century have been almost wholly agricultural, and consequently the one great object of development in Eastern Canada was to clear as much land of trees as possible, in order to make room for grain fields and pastures. Second, the wood pulp industry is a very modern one, being a development of the last quarter of a century.

In the United States, lumber began to get scarce for building, for furniture, and for other wood working purposes, earlier than in Canada, and this scarcity was much accentuated, owing to the more rapid expansion of pulp and paper manufacturing. When these two industries got well under way, it suddenly became realized that the area of pulp timber within profitable shipping range was already short in the Eastern States, and that in many large districts land was worth more for its timber raising capabilities than for agriculture.

Hence it has been the aim of those interested to obtain supplies of pulpwood from Canada where possible, in order to give a chance for home forests to grow again. In the meantime, observing that the reforestation of land has been for a long time a practical science in many European and eastern countries, scientists and educationists in the United

States have been during the past ten years pointing out the danger of the wholesale destruction of forests, which has been going on all over the States. These warnings have not been in vain, for the facts have come home in a very practical way to manufacturers, agriculturists, and even dwellers in cities.

To those who have not studied the question it may seem strange that the reforestation of the country should be a matter of personal concern to a farmer, but those, for instance, who have lived 50 years in the Allegheny region of the United States can tell a strange story of change of climate and condition brought about by stripping the country of trees. Early settlers on the slopes of the Allegheny Mountains can remember when the rivers and streams ran all the year through, and there was scarcely any drought. Now, since the land has been cleared of woods, they complain that during one part of the year the country is subject to deluges, which sweep away towns and villages (for example the terrible Johnstown flood), and hundreds of thousands of dollars in bridges and other public works, while during the following summer the land is parched with drought. In fact, the country in sections has become sterile through this cause. Seeing these changes worked out before their eyes through the wanton destruction of forests, almost every state in the Union either has created, or is preparing to create a department of forestry, or a special commission to make a study of this question. The principal universities, such as Harvard, Cornell, Yale and Columbia, have established forestry departments, and in every State thinking men realize the tremendous importance of forests as an influence on climate, rainfall, and the water supply of lakes and rivers; as well

as their importance to the manufacturing industries of the country.

What is the situation in Canada in regard to the study of forestry? Not a single Canadian University has taken up forestry as a science, and only a few experiments in tree planting at the experimental farm at Ottawa are the measure of official thought given to it by the Dominion Government. So far as the pulpwood question is concerned it is true that the Ontario Government has realized the importance of holding Canadian wood for Canadian mills, and has prohibited its export, except in the manufactured form of pulp. But in Quebec the situation is viewed in official quarters by looking through the reverse end of the telescope, so that the time for studying forestry as a practical need is so remote in futurity as to be indiscernible. The jubilation with which the Premier of Quebec boasts of having this year sold more tracts of pulpwood lands reminds one of Nero's violin obligato to the conflagration of Rome, except that, unlike Nero, the affable premier of Quebec is wholly unconscious of either cruelty towards his people or of folly in regard to their future interests. His ill-timed joy is rather like that of a spendthrift boy who comes into an inheritance and feels proud of the fact that he has been able to obtain possession of and spend half his fortune in the first year of his fortune.

In view of the vast forests still untouched in Northern Quebec, it might at first thought appear that these comparisons are rather overdrawn, but let us look at the actual situation. In the large tracts of pulp lands in Quebec today what quantity of pulp timber not already in the possession of United States and other foreign owners is there within profitable shipping distance for the

export trade? There may be a million square miles of pulp land in the Province, but if nineteen-twentieths of it is so situated that the pulpwood cannot be brought to market except by expensive railway haulage, of what benefit is it to the Province from a commercial point of view?

To come back to the climatology of the subject, the staple agricultural interests of Quebec are the dairy and its allied and dependent interests, such as hay growing and cattle raising, and the great valley of the St. Lawrence is, under Providence, indebted for its success in these lines to the timely and well distributed rainfalls of summer. Strip these regions of the great forests, and what will be the effect on the climate. It is certain from the analogy of other countries that the Province would be turned into a land of alternate flood and drought, and its great dairy industry would be destroyed, until the forests were replaced, and even then the danger might not be repaired, for the reason that in many districts the depth of good surface is not sufficient, when once washed out, to enable trees to take hold again. The process by which the present forests grew and gathered under them the present soil, is in many places a growth of centuries; but the washing-out process, as has already been demonstrated in some districts of the Province, is a very rapid one, and leaves a grave problem, not only to the agriculturist, but to the forester.

So we see that in this light-hearted destruction of the forests of Quebec, those responsible for the present timber policy are not merely preventing an enormous possible development of the pulp and paper industry within the Province, but are, by altering the climate and rainfall of the St. Lawrence valley,

likely to bring ruin on the future farming population which that great valley now supports. Indeed, the almost unprecedented drought of the present year may be the beginning of the permanent climatic changes which the wholesale destruction of the forests of this region will surely bring about.

It is worth while to notice as a feature of the discussion of the Chamberlain fiscal policy for the Empire, that the Paper Makers' Association of Great Britain has pronounced in favor of the Colonial Secretary's plan. Several prominent paper manufacturers, while not sanguine that the new policy would be adopted soon, were confident that it would give an immense impetus to the trade of Great Britain with the colonies, and would save the home market in some lines in which the home manufacturer is now not able to hold his own against the foreigner. As to the effect which a preference in the markets of the Empire would have on the Canadian pulp and paper trade, there can be little doubt in the minds of people in this country. With even a small rate of preference, Canada would soon supply to British paper mills more wood pulp than all other countries combined, while at a later stage a larger trade would develop with Australia, India, and other parts of the Empire, as the uses of wood pulp multiplied. This increased Canadian trade would lead to the profitable investment of British capital, and the employment of British brains and hands within the Empire that would under existing conditions drift to foreign countries. Along with this increase of our pulp trade an important development in Canadian paper manufacturing would follow, which is hardly to be looked for to the same extent under the present one-sided policy of Great Britain. For

instance, certain classes of paper which the United States is now shipping to Great Britain and the Australian Commonwealth in growing quantities could then be more profitably exported from Canada. In fact, many United States concerns would move their plants, or establish branch mills in Canada, where the natural advantage of cheap production added to the lower duties, would assure to them greater profits and a larger prospective trade. To these developments must be added the creation and extension of many lines of manufacturing in which paper or pulp forms the raw material of the factory. Yes, without question, an Imperial preferential tariff would lead to a tremendous expansion of the Canadian pulp and paper industry, and would open up to trade and agriculture vast tracts of territory now untouched and not otherwise likely to be developed for many years to come.



SOUTH AFRICAN PAPER TRADE.

The paper trade of South Africa is developing steadily, and the varied requirements of those growing colonies should afford an opening for some enterprising Canadian paper mills. For some time to come this market will be of little direct interest to our pulp manufacturers, for the reason that at present there is not a single paper mill in any of the South African colonies. Outside of the mining branch, South Africa has not heretofore been, and is not likely for many years to become, a manufacturing country. It is entirely devoid of trees of a fibre that would make good pulp, the native woods of Southern Africa being nearly all of that heavy, close, compact grain, which kind nature provides for the implements needed in a hot and

dry climate. Hence, these colonies will always provide a large market for the paper manufacturer, if not for the maker of pulp.

South African imports of paper have increased by a high percentage during the past few years. In the fiscal year of 1898, the last before the war, the total paper imports of the South African colonies and states were £616,913, of which £503,304 entered by way of the Cape Colony, £104,715 by way of Natal, and £8,894 by way of Portuguese territory (Delagoa Bay). In 1901, this total increased to £684,377, and in 1902 it rose to £973,662, of which £759,016 went in by Cape Colony and £214,646 by way of Natal, no returns being available for Delagoa Bay. This shows that Natal is making greater relative progress in the paper trade than any other part of South Africa, due no doubt to the fact that the obstacles thrown against trade with the British colonies by the late Transvaal Government being removed since the war, the import trade flows into the most natural channels, and Natal is getting a greater proportion of the Transvaal trade. The principal lines of paper which make up this total are as follows:—

ARTICLES.	1898	1901	1902
Books & Music, printed...	£195,779	£201,159	£276,837
Cards, Playing.....	—	131	4,342½
Engravings, Photos, etc..	16,778	18,397	—
Paper, Printing.....	68,157½	99,706½	31,491½
“ Wall.....	32,723	21,105	14,190½
“ Unenumerated....	3,024	194	10,683½
Stationery	300,452	343,686	636,121½

In the items of printing papers, wall papers, and unenumerated articles, the returns for the last year for the Cape Colony are not available, and these figures are for Natal only. Stationery papers come first in magnitude, but printing papers make a large total, there being in South Africa 200 newspapers and magazines, some of them comparing well with Canadian papers in mechanical get-up

and quantity of reading matter, if not in circulation. Great Britain at present supplies between four-fifths and seven-eighths of the paper trade of South Africa. Though in some lines British papers are higher in price, the quality is believed to be superior than of papers of foreign makes, and this reputation is sufficient to account for the preference. This remark would seem to apply more particularly to stationery, for quality is a first consideration with South African consumers who have means. Germany and the United States are the chief competitors of Great Britain in this branch in South Africa. Germany shipped there £32,480, and the United States £25,380 in 1901. Germany has not made much advance, except in the item of wall papers, but the United States has increased its trade to a noteworthy extent, the total in 1902 being £32,239 against £13,417 in 1898. In other words, the United States has more than doubled its exports to South Africa since 1898, and this fact will suggest that there is business in those colonies for Canadian manufacturers, if they will lay their plans to participate in it.



The new Technological School at Manchester will not be confined to the textile trades, but will have a department where all the processes connected with paper-making will be taught, including the production of paper from other materials than wood pulp.



—Efforts have been made to induce the Paper Makers' Association of Great Britain to send a collective exhibit to the St. Louis fair next year, but inasmuch as the total exports of British paper to the United States in 1902 amounted to £63,000, averaging in price about £50 per ton, it was agreed at the

recent meeting of the Association that in view of the present high tariff of the United States, it would be useless for the rank and file of British paper makers to send an exhibit.



—As a fact bearing on the tariff reform question in the Old Country, it is worth while to note that next to France the British colonies are the best customers the Mother Country has to-day for British made papers. Figures are given elsewhere regarding the South African trade. With regard to the Australian trade, Great Britain is now losing while the United States is gaining in that market. With preferential trade within the Empire, the Mother Country should regain, and Canada would also acquire a share of the trade that is now drifting into the hands of United States manufacturers.



—Ramie, (rhea, or China grass), has no doubt a great future, not only as a textile fibre, but as a material for paper. Ramie is not only longer than flax, but is more silky and lustrous, and is one of the strongest of textile fibres. Its strength makes it valuable as a material for paper, and where it can be largely used in textile manufacturing its waste can be extensively used for paper making. Up to the present one thing that has prevented the rapid growth of this industry is the difficulty of cheaply and rapidly degumming the fibre, but human ingenuity will sooner or later overcome this, and then the ramie fibre industry will assume great importance. Ramie will grow wherever cotton will grow, and in many regions where cotton will not. It grows wild in India and China, and can be cultivated well in any region

approaching the sub-tropics, such as Borneo, Australia and New Zealand, South Africa, Egypt and the Soudan, etc. It is doubtful if it would thrive in Canada, and if not Canadian mills would have no advantage over other countries in its manufacture, as it has in paper made from wood pulp; but ramie paper mills here would have a chance with the rest of the world just as Canadian cotton mills, though importing their raw material, have not only thriven as an industry for supplying the domestic market, but have been able for the past seven years to export cotton fabrics to China, in competition with United States and British mills. When ramie cloth comes largely into use, as it seems sure to do, a great deal of the raw material for paper mills will be gathered from the rag-bin and the clothing factories as well as from the waste of the spinning mills, so that the source of supply will not be so "foreign" as might be supposed on first thought.



TECHNICAL EDUCATION IN THE PAPER TRADE.

The following is an abstract of the concluding lecture of a series given before the Society of Arts, London, by Julius Hubner. The preceding lectures were reported in our earlier issues.

The lecturer, continuing his account of the process of making paper on a Fourdrinier machine, remarked that the first Fourdrinier machine had no drying cylinder, and then proceeded to describe the drying operation, pointing out that the number of drying cylinders varied considerably with the kind of paper made and with the speed with which the machine ran. The paper being in a damp condition was capable of taking a high-class finish. Printing papers which had been engine-sized were usually finished by a passage through three or four drying cylinders. In many instances the paper was cut on the machine length-

ways by so-called slitting knives. The lecturer next drew attention to a number of other paper-making machines, first naming the single cylinder or "Yankee" machine, which made machine-glazed papers, such as caps very highly glazed on one side only. It consisted of a web end, but contained only one drying cylinder of large diameter and with a surface very highly polished. Paper machines with two web ends had also been constructed. The papers bearing the watermarks of the Imperial Russian Paper Mills were made on machines with three webs of the Fourdrinier type, the watermarks being produced by the pressing of the three webs together. The cylinder machine invented by George Dickinson, about 1820, was then mentioned, the lecturer incidentally pointing out that cylinder machines were mostly used for the manufacture of various thick papers and boards. An interesting form of board machine consisted of four paper-making machines, namely, two Fourdriniers and two cylinders, and on it four distinct kinds of paper could be made and pressed together so as to form one solid board. The advantage of this was that finer papers might be used for the outside, whilst cheaper materials might be used for the inside of the board. Imitation handmade paper having the characteristic deckle edge could also be made on cylinder machines. The necessary slow drying of tub-sized papers to prevent the size coming to the surface, was illustrated with an interesting slide showing a series of two hundred and seventy-five drying skeleton cylinders. After speaking of the necessity of rewinding the paper carefully, a short account of the operations of web glazing, embossing, the cutting of the paper lengthways, and the requisite accuracy of cutting watermarked papers, led up to the subject of the testing of papers, the importance of which had been recognized in various countries, but especially in Germany. The pioneer in this direction, said the lecturer, was the splendidly equipped establishment in Charlottenburg. The great value of paper testing did not consist alone in ascertaining the

qualities and properties of a given sample. It could not fail to be of value to the maker of paper, because irregularities would be exposed, and remedies would suggest themselves. Its real object was not at first recognized by the German papermakers, but experience had proved that the testing institute was a true and valuable friend to the papermaker. To bring paper testing to the position of being of value to the papermaker, it must be carried out on lines similar to those adopted by the Russians. The results of all the tests, as well as the investigations into the composition of the various papers competing against the home industries in our markets, ought to be published periodically, and thus placed at the disposal of our manufacturers. The results of these tests might prove of great value to papermakers. A description followed of the various testing operations, the resulting reactions on the different classes of paper, the characteristics of the various fibres as seen under a powerful microscope, the use of the micrometer, and the other apparatus for testing the resistance that paper offers to tearing, crushing, rubbing, and folding, the quantity of ash in paper, and the necessity of carefully taking into consideration the chemical changes. In many chemical industries, those for instance like the manufacture of coal tar products, the results of laboratory research might be applied on a larger scale, but in other industries of a chemical character, such as bleaching, dyeing, etc., the application of any chemical reaction was naturally greatly modified by the necessity of the mechanical operations. For all work concerned with the development of the paper-making industries, it was assumed only to determine the direction in which progress was possible, and then with a machine of the industrial type find out the best methods of obtaining better results. The provision of machinery on which the experiments might be performed was absolutely essential. Although there were slight differences between the experimental results obtained with a small

machine and those obtained with a machine in industrial use, they were sufficiently close for practical purposes. The paucity of facts that had been established, giving a satisfactory explanation of the numerous difficulties with which paper manufacturers had to deal, was commented on, and attention was then called to the Manchester Municipal School of Technology, and the small experimental equipment it had launched out with, with which comparative tests could be made for making paper by hand and by machine. The machines were all driven by electric motors, and were supplied with speed regulators, and paper testing laboratories were furnished with all the latest appliances, following which remark a series of slides illustrating the same were thrown upon a screen. The principal object of such a school did not consist of teaching the youth merely the technology of paper making and simply making him acquainted with the processes and machinery employed. This stage of work must be regarded as only the final part of the whole educational scheme. The foundations of training consisted in a high-class general education, which must be followed by a sound training in mathematics, physics, and mechanical engineering. Carried out by this method it could not fail to be a success; otherwise failure must almost be the result. The relations existing between the manufacturer and the School should be of a most intimate character. Only if such were the case could such an institution become of value to the industries of the country. Such a state of affairs existed on the continent, and contributed to the welfare of the country as a whole.

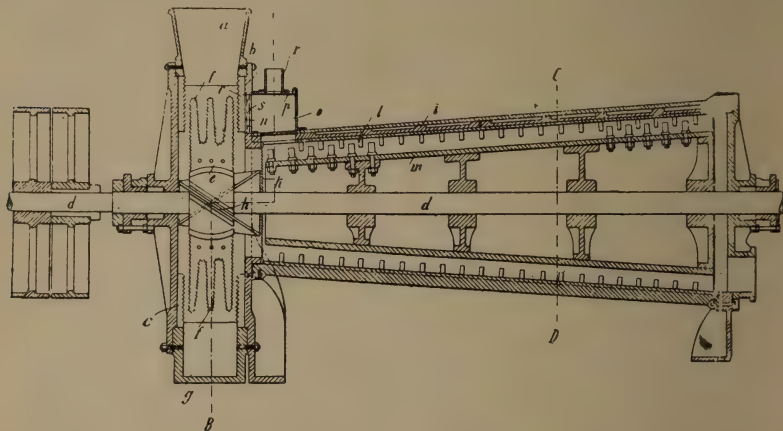


MACHINE FOR CUTTING AND PULPING BROKEN PAPER.

R. Dietrich, Merseburg, Prussia, Germany, has taken out a patent in England for comminuting and pulping broken paper. It is described by the Paper Maker as follows: "A is a hopper through which the raw material is fed into a mixing cylinder, forming part of the machine and arranged underneath

the hopper. The cylindrical casing B, which serves essentially as a mixer, is provided, at the interior of its side walls, with several plates or rows of toothed knives C. The knives may be differently arranged upon their base-plates, which are mounted upon the walls so as to ensure perfect grinding. The driving-shaft D is provided with a screw-shaped kneading device E, with wing-shaped parts F. The prongs, coming in contact with the freshly-fed mass of broken paper, take up every piece, and by co-operating with the knife plates C, effect a perfect tearing and grinding; the pulp obtained drops upon that part of the kneading screw which is contained in the casing B, whence it is carried forward and mixed by the screw. Any

The kneading screw E, with its wings, is preferably so arranged as to make 90—100 revolutions a minute. At this rapid rotation, a volume of air accumulates beneath the upper thicker portion of the mass of broken paper contained in the hopper, and this air, which collects in the casing B, is subjected to a steadily increasing pressure; in other parts of the mass, a partial vacuum is formed; these inconveniences greatly interfere with the delivery of the light paper pulp, to the conical drum I, through the delivery opening at the right-hand side of the casing. In order to overcome this difficulty and to ensure absolute reliability of working, provision is made whereby the variations of the pressure of the air, consequent on the



coarser impurities have to be separated at the proper time, so as to avoid breaking the knives and wings. For this purpose the inventor provides a receptacle G, into which all the heavy particles, stones, etc., drop. The hub of the kneading screw is provided with separate screw threads H, by means of which the material is caused to travel in the direction of the right-hand side of the drawing. This kneading screw is made up of a series of separate cutting blades, spirally arranged upon the shaft so as to alternate with the wings—which are set at an angle to the axis of the shaft, and of which two, diametrically opposed, wings, are preferably serrated on their outer edges only, the other two being serrated at their outer edges and on the inner edges of longitudinal openings.

blows of the wings F within the casing, are counterbalanced, thereby ensuring absolute uniformity in the movement of the comminuted broken paper. Grates S are attached to the openings N and between the grinding plates. Any pieces of string and similar long fibrous impurities, which have not yet been removed by being twisted about the arms of the kneading screw, will be retained by these grates. The lids P of the boxes may then be swung open, so that the attendant may get at the grates, and remove by hand any particles which may have adhered thereto, even while the machine is in operation. The boxes O may, however, have fixed covers, in which case the grates S may be reached through the short pipe R. The cleaning of the kneading-screw, however, has to

be effected while the machine is stopped. For this purpose, the driving-belt is shifted on to the idle pulley, and the rope, etc., removed by hand. After the pieces of broken paper have been prepared, by the means above described, they are passed for their final treatment to the conical drum I, the narrower end of which is fitted around the delivery opening of the kneading device E, so that the material may be conveniently caught and acted upon by the special attachments of the shaft D.



THE TESTING OF WOOD PULP.

(From the Paper Maker, London).

When pulp is uniform in moisture from one end of the bale to the other, there is probably little difference between the various testing methods in use. It is only when the pulp has become dried on the outside that disputes arise, particularly with mechanical pulp. We may suppose that we have five bales weighing, in gross, exactly 20 cwt. Suppose these five bales are tested by five distinct methods, giving five results. What shall be considered the best method?

This is the matter which forms the subject of the present suggestion. For the sake of example, we may suppose a case. The five bales have been sampled by the five methods. The samples have each been tested in the laboratory with the following result:—

Test No.	Percentage Air-dry Pulp.
1	49.8
2	50.0
3	51.0
4	49.2
5	50.5

mean 50.1 per cent.

Now, which of these is the most correct? At first sight, it would appear reasonable to consider that if five methods, each of which has some claim to be regarded as approximately accurate, are experimented on, then that method which gives a result most closely connected with the mean of the whole

five may fairly be regarded as the best. On these grounds we should select method No. 2 as being the most accurate of the series. The matter cannot be settled so easily as this, unfortunately. In the first place, each analyst has his method—and would not be ready, probably, to admit that other methods are as good as the one that he has seen fit to adopt. He would, therefore, not be inclined to admit that the mean result of five tests should give the correct figure. In the second place, a good deal of experimental evidence would have to be obtained before the truth of the suggestion could be established.

Now, with regard to the matter of experimental evidence, a single test on five bales along the line laid down would not be a conclusive one. The conditions for arriving at any safe deductions from a test of this kind would be—

(1) A complete scheme of sampling according to the 5 methods, so that the sampling could be repeated exactly in the same manner each time;

(2) The repetition of the test, again and again, on bales of the same brand and condition of moisture;

(3) The repetition of the experiments on different brands, some being in a normally moist state, and others abnormally dry.

In the light of these conditions let us examine our imaginary case. Re-arranging the results in numerical order we get:

Test No.	Percentage Air-dry Pulp.
4	49.2
1	49.8
2	50.0
5	50.5
3	51.0

mean 50.1 per cent.

Now, before drawing any conclusions whatever as to the value of these figures, we must obtain much more experimental evidence. Having done one test on five bales, taken from a stack that has not been exposed to air, so that the bales are fairly uniform as to the moisture from the outside to the inside of the bale, we must repeat the test ten or

twelve times, taking five bales each time, setting out the results as above. If the results are arranged in the order of the percentages of dry pulp, as in the second table, we may find:

(a) That the methods will fall into some approximate kind of order, with No. 4 falling generally into the first or second position, and No. 3 possibly into the fourth or fifth position.

(b) That the methods may not fall into any particular order, the variations in the order being too great to permit of any conclusion as to order.

If we find that the tests do arrange themselves in accordance with A we may assume that one method gives too high a result, and another too low a result. Suppose that on this assumption we find method No. 4 usually occupies first position, and method No. 3 usually comes last. In this event, we should have some useful information as to the relative merits of the several tests, and probably some ground for supposing that the two methods at the extremes of the table might be rejected. Such a course would scarcely be justified at the moment. The matter must be looked into further. If we find, however, that there is no order of merit, so to speak, in the methods, and that the tests arrange themselves in accordance with B, then we must, with the pulp being tested, take each test as of equal merit. Hence our experiments must be pursued further.

Another series of results should be obtained with pulp that is very dry on the outside and—what is most important for the sake of after comparisons—with the same pulp as in the previous series. That is, a series of ten experiments should be made on normally moist bales, five at a time, and another series of ten experiments on the same bales after they have lost considerable weight from exposure to air. In this way, we eliminate, to a large extent, the difficulties which would be introduced by taking other brands for comparison. Of course, the series should be repeated for different brands afterwards. In obtaining figures from rather dry bales, the differences between the tests will be ac-

centuated and probably the results will be more conclusive. The methods may fall into some more definite order. There is every reason to suppose that on a sufficiently large number of tests the order of merit will be more decisive. Suppose that is the case, and that method No. 4, taken over a long series of tests, does occupy the first position, and that method No. 3 occupies the last; this would be strong evidence in favor of rejecting those two particular methods, and the ground of enquiry would thus be narrowed down considerably. What difference would this make in the mean result? Curiously enough, in the case quoted, no difference would occur, for if we reject methods 4 and 3 the mean is not altered, as is shown in the following table:—

Test No.	Percentage Air-dry Pulp.
1	49.8
2	50.0
5	50.5

mean 50.1 per cent.

Such a result is a mere coincidence, hence we must not at once infer that the rejection of the two methods is proper. This can be seen by taking a second example:—

Series of 5 Tests.	Same series omitting extremes.
48.7	
49.8	49.8
50.1	50.1
51.2	51.2
52.4	

mean 50.44 50.37

In this case, the rejection of the two extremes alters the mean figure. The only inference is the safer one of taking some further experimental evidence. How, then, shall this be done? Clearly the mere repetition of the tests on various brands, and with varying degrees of moisture in those brands, will give valuable information, and serve to give data upon which the conclusions obtained by a study of the previous series would be largely confirmed. This is

not sufficient, however. We must consider the possibility of testing the bales selected for these special tests in some way radically different from the methods used in the trials, and, in a way that shall eliminate the difficulties common to all of them. Fortunately, this is not a difficult matter and we may investigate the question from a fresh standpoint, in order to get further data upon which to base conclusions.

The idea of drying out a whole bale has long been considered—at least, by the pulp manufacturers—as the only reliable and rational method of arriving at the true air-dry contents of a bale of pulp, and, no doubt, there is much to be said in favor of this idea. As a practical every-day method of testing pulp, the paper-maker would certainly not look upon this with any favor. He would at once point out:—(1) the enormous expense of treating the pulp; (2) the length of time required to make a test; (3) the loss of pulp incurred, since bone-dry mechanical is of no use in making paper. It must be taken for granted that no paper-maker would consent to such a course, and probably no one would seriously suggest that whole bales should be systematically dried out to the accepted minimum of twenty per cent. of the parcel for purposes of determining the air-dry weight. But, for the purpose of experimental evidence, the idea might be advantageously used, and, if the paper-maker possessed any conveniences for treating the whole bale, he might feel disposed, for the sake of the information, to undertake some tests of this kind. It is doubtful, however, whether many would care to do this, on account of the trouble and expense. The paper-maker argues that his yield per ton of raw pulp, or the amount of pulp used per ton of paper made, is, after all, the practical guide to the condition of the pulp. On the other hand, in justice to all parties concerned, the question should be submitted to a thorough investigation. Leaving, for the moment, this idea of drying out the whole bale, what course shall we adopt in order to obtain further experimental evidence?

Our suggestion is that some valuable evidence will be afforded by a series of special tests with the edge runner. Some years ago, the writer made an elaborate series of experiments with the edge runner as a possible standard of reference. In these tests, the following was the method of working:—Five bales of a normally moist pulp were carefully weighed, the tare of the staves of wood which formed the binding being deducted. These bales were then submitted to several methods of testing, the samples being drawn from the same bales, and dried out separately. The whole of the five bales, less the weight of stuff taken out for sampling, which was only a small amount, were then carefully broken down one by one in the edge runner. Just sufficient water was added to make the pulp run nicely, so as to get a uniform well-broken mass, with an entire absence of lumps. A note was kept of the amount of water added, though this first was not necessary. As the stuff was thoroughly ground it was allowed to fall on the floor and then well mixed with the shovel. The edge runner was not emptied for each bale, but filled up from time to time from the five bales, until the whole of these bales had been treated. As the bales were being ground, the finished pulp thrown out was packed up in tared sacks. Each sack was weighed so as to determine the weight of pulp in it. A note was made of the net weight of wet pulp in the sack, and a large handful, taken from various parts of the sack, was immediately weighed on a delicate balance and kept for ultimate analysis. Eventually, the whole of the five bales was broken up and weighed up in tared sacks, and a carefully selected average sample of pulp was taken out from each sack. The amount of dry pulp in each sack was thus found from the weight of stuff taken for analysis. This method has much to recommend it from an experimental point of view. In the first place, it is a radically different method from any of the ordinary systems. It reduces the pulp to an absolutely uniform condition, if reasonable care is taken. If variations occur they are not large, and these are

determined by weighing each sack separately, which thus eliminates the errors, for all practical purposes, entirely. It takes the whole bale into account by reason of the thorough admixture of all its parts. However dry the outer sheets, and however wet the inside sheets, the grinding reduces the whole pulp to a uniform state. The pulp is not rendered useless for manufacturing purposes, but can be used directly the samples have been taken from the sacks. The altered condition of the bales by reason of the water added, does not vitiate the result.

Take a case. Let us suppose that the bales tested weighed 20 cwt. and, tested, as the mean of five different methods, 50 per cent. air-dry pulp. Let us further suppose that this figure is actually correct. On breaking down this pulp with say, 11.25 lb. of water, and assuming no evaporation of moisture takes place during the operation, the pulp in the sacks will weigh 31.25 cwt. and test 32 per cent. air dry pulp.

20 cwt. at 50 per cent. is 10 cwt.

31.25 cwt. at 32 per cent. is 10 cwt.

As a matter of fact, the conditions are not so simple. Evaporation does take place to some extent, but this does not make any difference, because we only weigh each sack when it is ready, and the sample taken from it is also weighed at once, or, at any rate, securely bottled for future analysis. Hence we might expect to find some such result as follows:—

Net weight of wet pulp, 30.5 cwt.

Test (average). 32.79 per cent.

Dry weight of pulp, 30.5 cwt at 32.79
is 10 cwt.

It is more accurate to calculate the dry contents of each sack separately, and then add up the figures. Due allowance must be made for the weight of stuff removed on the original sampling by the several methods. This experiment must be repeated over and over again, in order to see to what extent it may be regarded as likely to be useful in discriminating between various methods. A few isolated tests are not of any real value because, unless the results are uniformly consistent, they are

worse than useless. If it is found, as the result of a long series of tests, that some method gives an air-dry weight closely approximating the weight determined in the edge runner, there is strong evidence in favor of that method, provided that the results of the edge runner method are consistent. It is in this direction that the writer suggests some useful work might be done. Such work can only be done in the paper mill where the edge runner is in use; and, since the pulp can be used at once in the beater, there is no reason why the experiments suggested should not be carried out. It may be argued by some that the condition of the wet pulp will not be sufficiently uniform to give reliable figures. This fear will easily be dispelled by a few experiments. The pulp in the various sacks may differ to some extent, but the contents of any one sack, properly mixed by thorough shovelling before sampling will give remarkably good results.

The idea of drying out a bale may be tried partially by those who care to try still another method of testing for experimental evidence in the following manner. Let Fig. 1 represent the plan of one sheet. For a uniform sheet, any one of the four small rectangles (a) will equally represent the sheet as a sample.

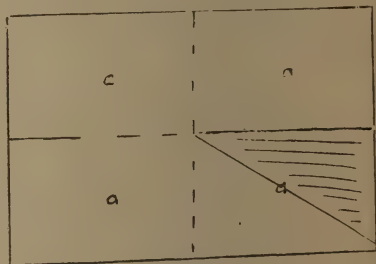


FIG. 1.

If the rectangle is cut in half by a line drawn through the centre of the sheet the rectangle—and therefore the bale—may be sampled fairly by taking either triangle. Hence, by cutting through the whole depth of any bale, a section whose area is equal to that of the triangle, will get an amount of pulp equal to one eighth of the whole bale. The bale after sampling, will have the appearance

of Fig 2. It is obvious we have here a good check on the results. It is absolutely necessary to make sure that the pulp is quite dry, and several re-weighings will be wanted for this. A

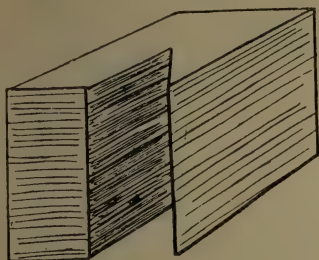


FIG. 2.

comparison of this with the edge runner method should yield some interesting figures.



IMPROVED METALLIC PAPER.

The Sudddeutsch Patentmetall-papier-fabrik, A.G., Furt, Bavaria, Germany, has obtained an English patent for a process of making an improved metallic paper which is air, water and grease proof. The object is to produce a metallic paper which possesses those properties for which tinfoil is valued for many packing purposes. It is said to be impenetrable to air, moisture and grease, possesses the same metallic lustre as tinfoil, adapts itself well to the articles to be packed without tearing or becoming brittle, and leaves behind it neither smell nor taste. It is particularly valuable for packing articles of food; and is considerably cheaper than tinfoil. Parchment paper is provided with a covering composed of a solution of suitable resin in an easily volatilized liquid, such as ether, alcohol or the like. This, on the one hand, makes the parchment paper moisture-proof, and, on the other hand, prepares the latter for combining with the metallic covering which is to be applied to it. The paper is now exposed to a current of air which accelerates the vaporization of the fluid in such a way that after a short time, or

after a short course traversed by the paper, an extremely thin dry layer of resin remains; this forms the binding material for the metal covering. The binding power which the resin skin loses in this condition is easily recalled thereto by warming the paper, by either passing it over a heated surface or drawing it, by means of rollers, through a vessel filled with bronze powder, and heated by any ordinary means. In a warm condition, the paper is brought in contact with the metal powder, preferably bronze, with which it is to be coated, the latter being brushed over the paper, and thus uniformly distributed. The vivifying of the adhesive power of the resin skin by warming it may also be affected by means of the metallic powder to be applied thereto, the latter being heated in bulk and the paper drawn through it. In both cases, the retained metal particles are embedded in the resin and thereby protected from atmospheric and other influences, so that in combination with the skin of resin they in turn form a protective covering for the paper. After dusting off the metallic powder particles which have not stuck to the resin, the metallic covering presents of itself, without further treatment, a perfect gloss, and does not, therefore, require a separate treatment for producing this gloss, such as is necessary when a watery binding material is used. The metallic particles brushed off are completely uninjured and are suitable for further use.



MATCHES USE UP FORESTS.

In the United States alone some 4,000,000 feet of pine lumber are used every year for matches, or the equivalent of the product of 400 acres of good virgin forest. About 620,000,000 cross ties are now laid on American railroads, and 90,000,000 new ties are required annually for renewals. The amount of timber used every year for renewals for ties alone is equivalent to 3,000,000 ft. of lumber. There are now standing nearly 7,500,000 telegraph poles. The average life of a telegraph pole is about

ten years, so that nearly 750,000 new poles are required every year for renewals. These figures do not include telephone poles, and the poles required on new railroad lines. The total annual consumption of timber for ties and poles is equivalent to the amount of timber grown on 100,000 acres of good virgin forest. For making shoe pegs the amount of wood used in a single year is equal to the product of fully 3,000 acres of good second-growth hard wood land. Lasts and boot-trees require at least 500,000 cords more. Most newspaper and packing paper is made from wood. Although this industry has been developed only within the last forty years, yet the amount of wood consumed for paper during that time has been enormous. The total annual consumption of wood for paper pulp is equivalent to over 800,000,000 board feet of timber, for which it would be necessary, were the trees all growing together, to cut some 80,000 acres of prime woods.—Chicago Chronicle.



PAPER STATISTICS.

According to a German paper mill directory, just published, there are in Germany at the present time, 490 paper mills, 476 board mills, 28 "Muhlen." These operate 981 Fourdrinier machines, 574 cylinder machines, 82 vats, and 633 grinders. There are also 67 cellulose mills, 29 straw pulp mills, and 5 "half-stuff" mills. These mills produce about a million metric tons of paper per year, of which 31 per cent is news and printing paper, 10 per cent. wood board, 16 per cent. letter and packing, 8 per cent. roofing paper, 5 per cent. straw board, and 7 per cent. fine writing.

Reports from the India office to the British Board of Trade show that there are in India only eight paper mills, of which four are in Bengal, three in Bombay, and one at Lucknow. The capital invested, so far as information is obtainable, amounts to Rs. 73,20,000. Most of the white and blue foolscap and much of the blotting-paper, note-paper, and

envelopes used in the Government offices is now obtained from the Indian mills. The total quantity of paper made in 1902 was nearly 47,000,000 lbs., and its reported value Rs. 64,38,319. The mills employ 4,865 persons. The capital employed has been trebled in 20 years, since 1883, and the production and number of persons employed have increased about six-fold. But in recent years there has been a depression in the papermaking industry in Bengal, owing to the importation in large quantities of cheap paper made from wood pulp, which is of more attractive appearance, if less durable, than paper made from grass, gunnies, and rags in the Bengal mills.

A German authority gives the following as the production in tons of paper in the following countries: United States, 1,905,000; Great Britain, 450,000; France, 350,000; Austria-Hungary, 230,000; Italy, 200,000; Belgium, 50,000. If the figures of the other countries are no more reliable than those given of Great Britain, they are not of much value to the seeker after facts; as the official returns for Great Britain for 1902 show the exports of British made paper from the United Kingdom were over 540,000 tons; to which would have to be added the amount consumed at home, in order to get at the total production.

Great Britain exported in 1902, 761,322 cwt. of writing and printing papers, and envelopes, 74,185 cwt. of wall-papers, 37,715 of paste-board, mill-board, and cards, 27,910 cwt. of paper bags, and 180,691 cwt. of other papers. These were papers of British manufacture, and do not include the trade in colonial or foreign made paper. Great Britain exported in 1902, 8,803 tons of linen and cotton rags, 30 tons of esparto grass, 3,069 tons of chemical wood pulp, 15 tons of mechanical pulp, and 2,445 tons of other paper materials. Her imports of paper were large. Among other items of these imports were the following: Paper on reels, 1,147,463 cwt., paper in the flat, 2,575,918 cwt.; printed or coated paper, 171,930 cwt.; straw-board and mill-board, 2,019,661 cwt.; wood pulp board, 555,970. And in raw materials

there were the following imports: Linen and cotton rags, 18,942 tons; esparto and other vegetable fibres for paper, 198,202 tons; wood pulp, chemical dry, 185,443 tons; wet, 13,161 tons; mechanical dry, 11,103 tons; wet, 316,002 tons; other materials, 14,656 tons.

Of a total value of £4,537,674 of papers imported into Great Britain in 1902, over 29 per cent. came from Norway and Sweden, the latter country now ranking first in the quantity supplied. The figures are: From Sweden, 1,122,425 cwt., valued at £730,236; from Norway, 917,441 cwt., valued at £612,571. This trade consists chiefly of news paper and pulp boards, as will be seen from the following details: From Sweden, unprinted papers (news, etc.), 989,583 cwt.; printed or coated, 51 cwt.; wood pulp boards, 103,122 cwt.; straw board or mill board, 29,669 cwt. From Norway, unprinted, 880,565 cwt.; wood pulp boards, 30,448 cwt.; straw board and mill board, 6,428 cwt. It will be suggestive to Canadians to know that this trade has been largely a development of comparatively few years. For instance the aggregate imports from Scandinavia (Norway and Sweden) into Great Britain in 1898 were 609,070 cwt., valued at £421,494, compared with the figures mentioned at the beginning of this paragraph. In other words the shipments of pulp and paper from Scandinavia to Great Britain have almost doubled in the last five years. Canada, as will be seen from the figures published in previous issues of the Pulp and Paper Magazine, is the most serious competitor of Scandinavia in the British market (and prospectively in the European market) and had this country awakened to its latent powers ten years earlier, we might to-day be sending to the Mother Country more of these products than Norway and Sweden combined.



PAPER MILL BOOK-KEEPING.

Our system consists of a combined classification ledger and trial balance and a manufacturing department record, both used as principal books in con-

junction with the regular books of original entry, and the customers' and creditors' ledgers, as well as any subsidiary books employed. With a view of attaining certain ideals in accounting, the classification ledger and trial balance and the manufacturing department record have been devised along new lines, representing a new and somewhat radical departure in double entry book-keeping. The classification ledger becomes virtually the "private ledger" and contains all the accounts incidental to double entry book-keeping, beautifully and systematically classified, other than the personal accounts—individual accounts of customers and creditors. The equilibrium of the ledger is readily attested by a unique trial balance feature, which is a check on the accuracy of the posting; and further provides a valuable safeguard against errors, omissions, irregularities, etc. A trial balance and a business statement exhibiting the assets and liabilities, and the expenses and profits, down to the close of any day's business, may be prepared, no matter how large the business, in from thirty to sixty minutes. This may sound like going to Harlem by rapid transit in fifteen minutes. Well, one is possible now, the other will be next year. The classification ledger in working order in any large business will reduce the work of the book-keeper very materially—about one-fourth. The manufacturing department record—that is the right name for this book—is, in fact, as well as in name the one book showing a very complete and elaborate record of the manufacturing department. It's the book of original entry of this department. It exhibits in clean-cut fashion, under distinct headings, among other things, these results: The quantity and the cost of the raw material, general supplies, etc., purchased.

Now, knowing the system briefly outlined above to be valuable and highly satisfactory from personal use, I hope I may be excused should I appear enthusiastic in my advocacy of its use by others; and while as a matter of fact it is most excellent and covers the needs of these progressive times, I want to

say that it is not the only good system—there are others, and I believe any one of them is about as far ahead of the old systems as the twentieth century express is ahead of the old stage coach.—E. H. Haas, in Paper Trade Journal.



REDUCING PAPER CURRENCY TO PULP.

Half a dozen hired laborers, says the Brooklyn Eagle, earning about \$60 a month each, from the Treasury Department at Washington, destroy every day in the neighborhood of a million and a half dollars. They work in the basement of the big Treasury building, and their principal duty is to carry boxes full of paper dollars, fives, tens, and twenties, and dump them into a giant macerator, where sharp knives cut them into tiny shreds until they are reduced to a watery pulp.

The destruction of paper currency is part of the Aladdin-like process by which the Government gives out new money for old. Any person presenting a tattered and worn-out bank note at the Treasury Department will receive for it a crisp note that has never been folded. The same exchange may be made, even if the note has been torn into bits, providing that all the pieces are presented. It keeps a comparatively large force of men constantly at work to attend to the destruction of notes that come into the department in a worn-out condition. A regular routine is observed for getting rid of paper that has been condemned, and the strictest sort of rules are enforced to prevent frauds and losses. The average life of a Treasury or bank note is from three to four years. In times of business prosperity, when money passes from hand to hand more freely than in dull seasons, a note will have outlived its usefulness in a shorter period, but ordinarily when a piece of paper money leaves the Treasury it stays out in circulation for three or four years. When it begins to get dirty looking and frayed about the edges it is sent by some bank to the department for redemption. If it happens to be a na-

tional bank note it is thrown aside, for the redemption of national bank notes is conducted separately from that of regular treasury notes. There is always on duty at the department an agent of the national banks, who keeps tab on the notes of his clients that are set aside for redemption. At the end of each day an accounting is made, and the various banks are credited with the amounts of money condemned as useless for circulation purposes. The Bureau of Engraving and Printing prints a new supply of notes equivalent to those destroyed. The same process is followed with United States notes that come in for redemption.

The greatest care is naturally observed in counting the money marked for retirement. It is gone over time and again by skilled counters, and is finally stacked up in bundles six or eight inches high. These packages are pushed under the blade of a monster knife that is operated by electricity, and in an instant the bills are cut into halves. They fall into a large box that is near, and when the receptacle is filled it is closed and securely locked, when it is ready for the trip to the macerator. This is located down in the bowels of the department building. A force of sturdy laborers pick up the boxes and carry them to the macerator. There, in the presence of the treasury official and the agent of the national banks, the boxes are unlocked and the contents dumped into the dark enclosure. Six or eight sets of sharp steel knives revolve about the interior, while a chemical liquid is introduced to hasten the pulp formation. The opening is locked and the grinding process begins, continuing for several hours. At the end of that time the money is reduced to a whitish mass about the constituency of pasty dough. It is shipped to the Bureau of Engraving and Printing, where it goes through the same process again. The knives in this macerator are smaller than those in the department and they cut up the bits into very fine pieces.

The Government is of an economical turn and sells all this pulp. It is dis-

posed of at the rate of two cents a pound, the income from this source being about \$5,000 a year. The pulp is rolled out into boards about 3 by 8 feet in length, and these are eventually sold to paper manufacturers. A small proportion, however, is saved for a few favored individuals of this city, who manufacture images of various kinds from the material. Visitors to Washington have seen the miniature Washington Monuments, Capitols and White Houses which have been modeled from the pulp of paper money. They are on sale at many of the stores throughout the city. It is reported that the men who first conceived the idea of manufacturing these models earned a fortune from their sale. It is possible to buy for 50 cents a model of the Capitol composed of pulp originally worth \$100,000.



EXPORT OF PULP WOOD FROM ONTARIO.

The Kingston Whig says: Our export duty does not produce the desired result in forcing the manufacture of pulpwood into pulp and paper in Canada. The correspondence of the Watertown Times indicates that the Adams-Dufour Company, of Champlain, have the contract for getting 10,000 cords of pulpwood from Canada to Watertown at a cost of \$3 per cord. It is unloaded from barges by hand, but will be loaded on cars in like manner and by the same machinery used in loading ice. The entire lot would make a pile of wood four feet high and sixteen miles long.

If this statement is correct, the law is being violated. There is no export duty on pulpwood, Ontario not having the power to impose such, but the same object is attained by a clause in all Government leases providing that the wood cut on the lands shall be made into pulp or paper in Canada. Quebec has no such regulation, and the purchasers of pulpwood in that province can take it where they choose to be manufactured.

Nature has lavishly stocked her storehouses in this country, remarks the Brockville Recorder, and day by day a most fresh supplies of wealth are being discovered. New demands bring to the front what but a few years ago were considered of comparatively little value. The small, coarse timbers which we now call pulpwood, and which has assumed a value in the markets of the world of comparatively recent creation, was not long since of very little consideration, but the use of wood pulp in the manufacture of paper has changed all this, and Canada has an asset in her pulp territory that means a great deal.

The manufacture of pulp, according to the year book for the year 1902, in Canada, was carried on by 35 mills, which had an output of 240,989 tons. Of this quantity 155,210 tons were mechanical pulp, 76,735 sulphite, and 9,044 soda. The growth of the industry is considerable. In the census of 1881 there were five establishments, with an output of \$1,057,811.

Of the product of Canadian mills the customs returns show that during the calendar year 1902 the export amounted to \$2,511,664, leaving \$1,871,518 for home use. In a general way, therefore, we export about 57 per cent. of our production. Of the \$2,511,664 worth exported by Canada in 1902 Great Britain took \$976,192, the United States \$1,518,139 and other countries \$17,333. The market for this product in the United Kingdom is large. In the calendar year 1902 the requirements of Great Britain were of the value of \$11,671,367, of which seven-elevenths were chemical pulp and our export in 1902 to Great Britain was about 8½ per cent. of her needs. There is thus an immense market available in Great Britain for Canadian pulpwood, if we can but get control of it, but as yet we have not made very rapid progress. In 1896 we exported to Great Britain pulpwood to the value of \$45,601, and in 1900 the business has grown to \$1,199,317. In the latter year, however, the total imports were \$12,739,907, of which Nor-

way supplied \$6,439,111 worth and Sweden \$4,039,338. From the United States pulpwood was purchased to the extent of only \$269,599.

Ontario's laws in regard to pulpwood are undoubtedly the best in the Dominion. The Government sells no land, it but grants the right to cut on a certain territory, and on this territory a mill or mills must be erected to employ not less than a stated number of men, and manufacture a named quantity of pulp each year. Then the company making this contract has to pay the Government forty cents for every cord of pulpwood cut, and the latter retains the right to increase the price should the market warrant. Ontario's policy is one of development and for the production of revenue combined, while Quebec's is an immediate revenue producer only. The former has yet a sufficient quantity of pulpwood to pay the cost of Government for at least twenty-five more years at forty cents per cord, and pulp forests will reproduce themselves in a little longer than that period. With judicious management there appears to be little cause for alarm as to the revenue.



THE GREAT SPRUCE BELT OF CANADA.

Generally speaking, says the American Lumberman, the geographical line which divides the United States and Canada passes through a heavy timber belt, and this holds good the greater part of the distance from the Atlantic to the Pacific ocean. The spruce of Maine and New York has its counterpart in New Brunswick and Nova Scotia; the white pine of Michigan, Wisconsin, and Minnesota extends across and up into Ontario and Manitoba. There is a short stretch of prairie country, and then come the western woods, Douglass fir, cedar and the various pines of the coast. The character and extent of this timber are pretty generally known.

There is, however, a portion of Canada of which little is known except that it is heavily wooded, principally with white and black spruce. This northern

belt is perhaps greater in extent than all of the other timber lands of the country combined, extending in a north-westerly direction from the east coast of Labrador north of the fiftieth parallel to Alaska. It covers a space about 3,000 miles long by 500 miles wide and is said to be the greatest continuous body of timber in the world. This country has been partially explored, mostly by hunters and trappers, though no scientific explorations have been made in anything like a comprehensive manner. The lower portion of the timber is said to be of a size which will produce lumber, but the great bulk of this 1,500,000 square miles of timber is fit only for pulpwood. In addition to the spruce is to be found a small amount of poplar and larch, and a few other woods, but spruce predominates. Great patches have been burnt into this solid timber and a bird's-eye view would show a checkered appearance, due to the different stages of growth in reproducing the forest. The white spruce attains its growth in about 150 years. It would seem from the appearance of the forest that the native tree replaces itself when destroyed from any cause, as the burnt over patches show trees of all ages, 25, 50 or 100 years old.

The contemplated extension of the railway from Sault Ste. Marie to Hudson Bay will give access to a part of this forest, and when it shall have been completed the section through which it operates should supply much of the pulp material for the world's uses and give the spruce of the eastern coast into the control of the lumbermen, as the size of the trees in the latter section are more adaptable to the manufacture of lumber.

Below the fiftieth parallel, which is the northern limit of the white pine of the United States, is a fine belt of timber that yet has been hardly touched. It is not a continuous growth of timber, however, as it lies too far to the north to permit the attainment of perfection, as timber decreases in size as it nears the fiftieth parallel. North of this timber comes the spruce belt to which reference

has been made, and this extends north until the trees degenerate into shrubs and vegetation ceases so far as timber is concerned.

There is a great future before the Canadian spruce, and interest in it is steadily increasing, as the demands of commerce encroach further upon the supply of spruce in the east. Another decade will doubtless witness at least the beginning of its exploitation, if the exigencies of commerce shall not call for its utilization before that time.



THE HARMSWORTH PROJECT.

The St. John's, Nfd., Herald, of Aug. 3rd, announces that Harold Harmsworth and M. M. Beaton are guests at the Government House, having come to perfect the plans for the proposed pulp-making enterprise of which announcement has been made. They were to be joined in about ten days by an eminent American geologist, who will make a personal examination of the interior coal areas. He will determine if the geological formations evidence the existence of coal in workable quantities, and if so boring will be started. If his report is unfavorable, the scheme, so far as coal is concerned, will fall to the ground. But this will not necessarily mean the collapse of the pulp enterprise, because that can be carried on independently of a local coal supply, provided the requisite lands can be obtained. The negotiating for this is now in progress, and the next few weeks will witness some large developments in regard to forest areas in this colony.



THE BRITISH TARIFF FIGHT.

The discussion of the new fiscal policy in Great Britain waxes hot in all quarters, and the incontestable proofs furnished from official statistics in favor of both free trade and preferential tariffs must be bewildering to the man in the street. The country is flooded with essays, pamphlets, and "educational" leaflets on both sides, and it is safe to say that

whichever policy wins, the agitation will let a great deal of light in on the ordinary British mind on questions that affect the prosperity of the various home trades.

Here is a sample of argument on the free trade side of the case, as affecting the paper and pulp trades: Speaking at a recent meeting in London, Sir John Leng, M.P., the well known proprietor of the "Dundee Advertiser" and other papers, said he would give his audience a concrete illustration from three allied branches of industry with which he was connected. These were (1) papermaking, (2) printing on paper when made, and (3) publishing papers when printed. These were all industries in which large numbers of people were employed. Some present might not be aware that a very large proportion of the paper on which their daily newspapers were printed was made from wood pulp. There were two sources of supply of that pulp—Canada and Scandinavia. Giving the figures in round numbers from the Board of Trade returns for 1902, our imports from Canada of wood pulp last year were valued at £250,000—a quarter of a million—but from Norway and Sweden they amounted to £2,000,000, being eight times more than from Canada. The wood pulp was the raw material largely used by the great paper mills in the United Kingdom. If Canada were to have a 10 per cent., or 20 per cent., or 33 per cent. preferential duty imposed on other countries, it would not only raise the price of Canadian, but of Swedish and Norwegian pulp, and would proportionally raise the price of newspaper printing material. Then it must follow that paper which came in from abroad must also come under an equivalent preferential tariff. In 1902 we imported paper from Canada to the value of £82,656. But our imports of paper from Norway, Sweden, Germany and Holland amounted to £2,148,000. That paper was used by our newspaper and other printers. It would not be imported if it were not required, and if it were not found of advantage to use it. And so for the benefit of Canadian paper mills to the extent of exports of £80,000 our printers were to be taxed on £2,000,000 and upwards, and

that was not all. According to Mr. Chamberlain, the wages of all our work-people must be raised to meet the taxes on food and provide for old age pensions. Therefore the wages both of the workers in paper mills and in printing offices must be raised. That would still further enhance the cost of producing both newspapers, reviews, magazines, and books. What a delightful prospect this opened up to printers and publishers in trades which had been growing so rapidly, and which in the production of cheap literature had been so beneficial not only to the working classes, but to all classes of the community. Having some interest in a Canadian pulp mill, he could speak on this subject with impartiality, and, looking to the interests of the trade of the country at large, it appeared to him absolute folly to propose that for the sake of the small exports from Canada, the enormously greater exports from European countries should be subject to preferential imposts.



THE STATIONERS' COMPANY.

The 500th anniversary of the Stationers' Company was celebrated on the 10th June, when the guest of the evening was the Archbishop of Canterbury, who at one time was substantially concerned with the censorship of the Press, and who is still presented by the Company with a set of almanacs every year. The Company, or at any rate a parent association, in all probability existed long before 1403. Originally it consisted of a fellowship of text writers, and its work was confined to the preparation of deeds, indentures, and legal documents, to undo men, as Jack Cade put it. In course of time, this fellowship was divided into two branches. One, called the scribes, applied itself to the dark work alluded to—work, indeed, from which their name was derived—and the other, called the stationers, undertook the humaner arts of writing, binding and selling books. The capital for the publishing business, which is carried on to this day, was subscribed by the members in various proportions, and the profits were divided

on that basis. It was known as partners' stock. At first there were several of these stocks, but in 1601 they were merged into one whole. The capital now represents a sum of about £42,000. The copyright register was established by the Company at the beginning of the sixteenth century, and in 1662 a Bill was passed in Parliament requiring all copies of printed works to be registered at Stationers' Hall; and this was confirmed in 1842 by the Act which makes the registry a sine qua non of the title to sue for protection.—The Paper Maker, London.



RECENT PATENTS.

Among recent Canadian Patents are the following relating to the pulp and paper industries:

Method of bleaching paper pulp. R. C. Menzies, Musselborough, Scotland.

Process of bleaching paper pulp, etc. Fred H. Long, Chicago.

Paper pulp screen. Wm. R. Farnsworth, and H. R. Farnsworth, Tarver's Falls, Mass.

Pulp screen. N. L. Vrooman, Watertown N.Y.

Sizing Paper. Dr. C. Wurster, London, England.

Machine for making carbon paper. Crown Paper Co., Kittery, Maine.

Machines for making cartons and tubular box cases. Alf. Birnie, and C. W. Gay, W. Springfield, Mass.

Paper folding machine. Handifold Toilet Paper Co., Boston, Mass.

Machine for coating paper. C. F. W. Schumacher, Kalamazoo, Mich.

Paper making machinery. David N. Bertram, and Saml. Milne, Edinburgh, Scotland.

Roller for paper making machinery. Wm. E. Sheehan, Albany, N. Y.



—An international exhibition is to be held in Manchester, England, in 1905, and the paper trades as well as the textile trades will be prominently represented. This will be a good opportunity for Canadian pulp and paper manufacturers.

VALVE FOR PULP VATS.

Among the United States patents recently issued is one to James Emmet Foy, of Troy, N.Y., for improvements in valves for paper machine vats. "It is a desideratum of importance in machines of the class to which the invention relates," says the inventor, "to keep the height at which the contents of the pulp vat stand constant during the operation of the paper-making machine; and the object of this invention is to provide a simple, practical, durable, and inexpensive mechanism by means of which the level of the contents of the vat may be automatically kept at a constant height."

which the improved valve and operating mechanism have been attached. 2 is a bracket secured at one side to the vat and supporting the valve-controlling mechanism. 3 is an arm pivotally mounted in the bracket 2, and having secured at its free end a float 4, which rests upon the surface of the water in the vat. 5 is a rod connecting the arm 3 with the valve flap 7, and made adjustable by means of thumb nuts 6 6.

The valve consists of a flap 7, mounted in an annular frame 8 and adapted to turn on trunnions 9 9, which have bearings provided for them in the annular frame 8. The trunnions are diametrically disposed on the flap 7 in order to keep the pressure of the contents of the vat

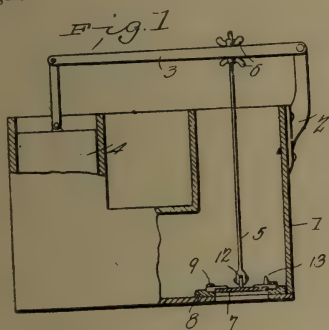


Fig. 2

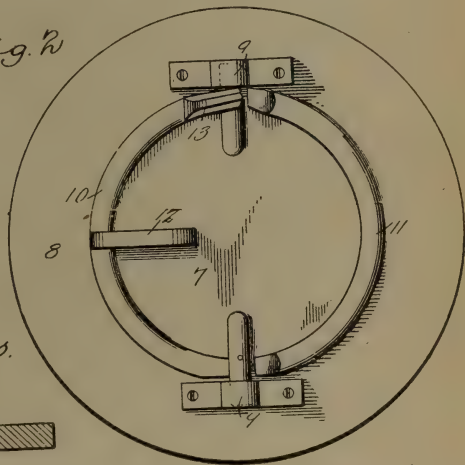
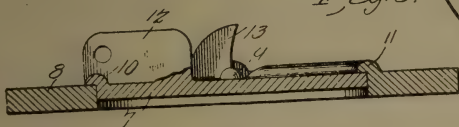


Fig. 3



In the accompanying drawings is shown a preferred form of embodiment of the invention, it being understood that the inventor does not wish to be limited to the exact form, proportions, or mode of assemblage of the elements shown therein, but reserves the right to make such changes as do not depart from the spirit of the invention, and which lie within the scope of the claims. In the drawings, Fig. 1 is a view in side elevation of a vat with the valve and operating mechanism mounted therein, parts of the vat being broken away to show the valve mechanism. Fig. 2 is a plan view of the valve, and Fig. 3 is a view of the valve in vertical section.

Referring to the drawings by reference characters, 1 represents a pulp vat to

on either side of the line connecting the trunnions even. The flap 7 is preferably circular in outline, though it may be of different configuration, if desired, and for half of its circumference on the upper surface it is provided with a flange 10, which is adapted to contact with the frame 8 and to serve as a stop to limit the movement of the flap 7 in the annular frame and form a portion of the valve seat. A similar flange 11 is provided at the margin of the opening in the annular frame 8 on the side of the trunnions opposite to that on which the flange 10 is located.

The flange 11 of the frame 8 completes the valve-seat and also serves, as does the flange 10, to limit the movement of the flap 7 in the frame.

Mounted on the flap 7 on the same side as the flange 10 is a lug 12, which forms a suitable means of attachment for the rod 5, which connects the flap with the pivoted arm 3. At one end of the flange 10 there projects upward a lug 13, which contacts with the flange 11, when the flap 7 has been opened until it stands almost at right angles with the plane of the frame 8. The purpose of the lug 13 is to prevent tilting of the flap 7 until it passes the plane at right angles to the plane of the frame 8, and consequently tends to turn completely over on its trunnions. If means were not provided to limit the opening movement of the flap, it might be accidentally turned until the flange 10 came on the same side of the opening in the frame 8 as the flange 11, in which position the pressure of the contents of the vat would tend to hold the flap and would prevent its automatic action.

In making the improved valve for paper machine vats, any suitable material may be employed; but a metal not easily affected by corrosion or some substance like vulcanite, which may be readily molded, and which is also unaffected to any appreciable extent by chemical agents, forms the most suitable material for use in constructing the valve. The valve-flap, its trunnions, the flange 10, the lug 12, and lug 13 may be cast in one piece, and the frame 8, and its flange 11 may also be cast in one piece; but at least one of the bearings provided on the frame 8 for the trunnions 9 9 must comprise a removable member to permit the assembling of the flap and the frame in proper relation.

The operation of the improved valve may be stated as follows: The height at which the level of the contents of the pulp vat is to be maintained having been determined, the thumb-nuts 6 6 on the rod 5 are adjusted in position until when the float 4 is at the desired height the flap 7, which is, of course, pivotally connected with the rod 5, is closed, so as to prevent any escape of the contents of the vat through the valve. If the level of the contents of the vat rises the float 4 will move upward, lifting the arm 3,

which through the rod 5 will also lift one side of the flap 7, so opening the valve and permitting the escape of a small amount of the vat contents through the valve. As soon as the quantity of water which escapes through the opened valve is sufficient to restore level of the vat contents to its original height the float will have reached its original position, the arm 3 will have descended with the float, and the valve will have been closed.

As the pressure of the contents of the vat upon the valve-flap 7 is the same on each side of a line connecting the trunnions, it is evident that a very slight pull on the lug 12 will cause the valve to open, and consequently a very slight variation in the level of the contents of the vat will cause the valve to open promptly and at once permit the escape of the excess of water through the valve. It will also be noted that as the valve is adapted to open promptly, any considerable rise in the level of the vat contents is impossible, and consequently the valve can never be opened so wide that it may not be closed before any appreciable amount of water in excess of that necessary to restore the original level of the vat contents has escaped. If desired, the flanges 10 and 11 and the portions of the flap and frame which co-operate therewith may be provided with gaskets of rubber or other suitable packing material. Such provision is, however, common in valves of all sorts, and hence special illustration thereof is regarded as unnecessary.



THE PULP MILLS OF CAPE BRETON.

A correspondent of the Sydney Record, who recently visited the pulp mills of Cape Breton, gave an interesting account of what he saw, and discusses the possibilities of this industry, which, though not so extensive as the steel industry, is likely to play an important part in the future prosperity of that island. We give some extracts, relating to the operations of the North River Pulp & Lumber Co., whose works

are situated in the forest wilderness, and on the shores of St. Anne's Harbor, under Harold Barnjum, assistant manager.

We first entered the engine room which runs the sawing and barking machinery, and which is supplied with two large engines of about 100-horse-power each, and connected with the barking and sawing mills, which occupy the rest of the building, which is one hundred feet long, by sixty feet wide. But perhaps the different operations in the manufacture of pulp will be better understood if we follow one of the company's logs from the lower end of their boom at the mill, till it is prepared to be rained down into the vessel at the company's fine wharf. A workman at the bottom of the log haul, with his boat hook, catches a log out of the boom and floats it in till it touches the endless chain running up to the mill. If the timber is meant to be prepared into pulpwood, as is generally done with all timber less than ten inches, the logs are conveyed to a large vertical saw. When the log is gone three feet beyond this saw is stopped by a gauge. The operator presses a lever with his foot, and quick as thought the ponderous saw and its carriage, weighing in all, perhaps, a ton and a half, moves forward, pivoted on an enormous hinge beneath. There is a sudden whiz and a block is cut. The saw again moves into its former position without any action on the part of the operator. Once more the log is in motion, another swift whiz and another block is cut, and so on, log after log, at the rate of fifty, sixty, and seventy and sometimes ninety cords a day. The blocks are, as they are cut, dropped upon another endless chain to be conveyed to the barking machines. The machines are quickly adjusted to the different sizes of blocks, and keep the blocks rapidly revolving. The barking machines, of which there are six in the pulp company's mills at Murray, are vast iron cylinders with large knives fitting into their sides like the iron in a plane, and which are kept rapidly revolving. The blocks as finished drop on another

endless chain, which dumps them at some distance from the mill. The refuse is carried automatically to the boilers.

The loading of vessels with the pulpwood is also done automatically. When a vessel arrives, the blocks are taken from the dump where they were deposited after being prepared, and placed in two conveyors. From the ends of these conveyers the blocks are poured into a longer and larger conveyor which runs out to the end of the company's wharf perhaps seventy-five yards distant. This conveyor continually keeps a stream of the prepared timber pouring into the vessel.

In addition there is a large sawmill with a fine fire engine and an electric dynamo. The saws and knives for the mills are sharpened by steam emery stones.

The forest from which the logs are obtained is on a high plain forming the boundary between Northern Victoria and Northern Inverness. On this plain rises the North River, the Barsois, Indian Brook, Little River, French River, etc. These rivers drain the greater portion of this central plain, thus making waterways on which the greater portions of the forests can be conveyed to a convenient place of shipment. Let us for the present, however, confine ourselves to the basin of the North River, where the company is now operating.

The North River flows out of the lowest of a number of lakes which are connected with one another by small streams. The timber as cut is deposited on the ice in the nearest of the lakes. At the upper end the company have erected dams. When a freshet comes, these dams are closed until they are filled. Then they are opened and on the artificial waterway so formed the logs are conveyed to the next lake, some miles distant, and there subjected to a like treatment till ultimately, they reach the main river, which has been blasted wherever there are falls. When the logs run into St. Anne's Harbor, they are met by the company's boom, two and

one half miles long, and made so as to guide the timber to the mills.

Interviewed as regards the company's plans for the future, Mr. Barnjum stated that notwithstanding what has been published as to the erection of pulp mills, etc., they had as yet made no arrangements. It will not be long, however, before it will be necessary under their agreement for them to transform their pulpwood into pulp within the province. Your correspondent was informed that an expert who was down there some time ago said that he had within an area of one square mile seen timber to the value of over one million dollars. When with this fact one considers that the company's lease includes almost all the ungranted lands in the Island, he will understand what a wealth of forests the company have at their disposal. At the present time the company have in their employ one hundred men in the woods, while the mills take thirty or sometimes more for their operation. Mr. Wilkinson is head engineer at the mill, and it is largely due to his skill that the company has such an efficient plant.

Mill Matters

A few days ago an employee of the Laurentide Paper Company was instantly killed at Grand Mere by a log rolling on him.

A new industrial centre, to be known as Clarke City, is to be established on the Labrador coast by the North Shore Railway and Navigation Co. A pulp mill and other works are to be built.

It is reported that a pulp mill is shortly to be erected, to employ in the neighbourhood of 300 men, on the Gulf shore, at the mouth of Powell River, British Columbia. The syndicate having this undertaking in view have in the aggregate an area of two hundred and fifty square miles of spruce timber lands at various points on the mainland coast. The site of the proposed mill is 50 miles from Vancouver. R. E. Turner is one of the chief promoters.

The Fraser River Power and Pulp Company has been specially incorporated as a Limited Company, in British Columbia, with a capital of \$100,000, divided into one hundred thousand shares of one dollar (\$1) each.

G. H. Frazer, foreman for the Grois Water and Grand River Pulp and Lumber Co., who has just returned from Labrador, states that the company possesses an almost inexhaustible forest growth on their property. Saw mills are being erected, and the unlimited supply of pulpwood will also be utilized.

The machinery in the big pulp mill at St. George, Charlotte County, New Brunswick, built by American capitalists, has been started to-day. It is generally believed that the owners of this mill will also erect a paper mill in the near future, as experience has shown that it is much more profitable to manufacture the pulp than to ship it to the paper mills.

Harvard University, through the Lawrence Scientific School, has established a course in forestry, instruction to begin next fall under the direction of R. T. Fisher, who is now in the employ of the Bureau of Forestry. Mr. Fisher has had considerable experience in the forest problems of that country, being the author or collaborator of several bulletins published by the Bureau. He is particularly fitted for a New England school, having given much attention to wood lots and forest conditions in that section of the States.

The Parsons Paper Co, of Holyoke, Mass., which in January, 1902, gave a trial to the plan of profit sharing among its employees, has abandoned the plan after an experience of a year and a half. The dividends on the men's wages amounted to 4 per cent. The only published reason for abandoning the policy is that the men do not seem to appreciate it, and some forfeited their share by leaving the company's employ. Probably the strike from which the mill, along with other Holyoke mills suffered, had something to do with the decision.

Miss Helen M. Gould has been asked to act as arbitrator in the big strike in the Holyoke paper mills. The invitation was forwarded by the leader of the striking cutter girls. The strike involves 4,000 employees.

The Government of New Brunswick is considering an application from the owners of the Cushing pulp mill for the purchase and lease of a portion of the asylum property near the water front just above the bridges, at St. John.

The Dowd Milling Co., of Ottawa, are seeking to acquire control of the water power at Dryden, Ont., for the purpose of operating a flour mill and elevator, but the pulp mill people appear to have a prior claim, and were supposed to have completed arrangements for commencing work last May. What they purpose doing is not clear.

In recent years iron pyrites has supplanted sulphur for the manufacture of acids such as are used in paper making. The production of iron pyrites in Canada in 1902 was 35,616 short tons, valued at a little less than \$4 a ton. The world's production of sulphur is estimated at 636,761 metric tons, (a metric ton is 2,204 lbs.), and of pyrites, 1,707,723 tons equal to the displacement of 824,725 tons of sulphur.

The Windsor Mills correspondent of the St. John's News says the water has been let into the flumes of the Canadian Paper Co., and the water wheel that turns the big machine has been running. A new steel chimney stack is erected, and four new boilers are almost ready to steam up for drying and heating purposes. Although there is much work yet to be done to finish all, especially the wood pulp mill, it is expected to make paper in the course of a week or so.

The St. John Sun says there is some likelihood of the Chatham pulp mill being started again at an early date. Recently R. A. Lawlor appeared before the town council, and on the strength of his representations the councillors agreed to fix the assessment at \$100,000 for ten years in the event of Mr. Stuart or any other parties deciding to again begin the

manufacture of pulp. Mr. Stuart had hopes of interesting some capitalist in the matter, and it may be he will succeed in getting the mill started.

The Inglewood Pulp and Paper Co. have had scalers going over their timber lands burned in the recent forest fires in New Brunswick. The reports are that the property is or was a finer one than even the owners knew. There is standing about two hundred million feet, every stick of which was killed by the fiery blast. The only way in which this lumber can be saved is to cut it as speedily as possible, otherwise inside of three years it will be destroyed by the worms. It is expected that large crews will be sent into the woods this winter to chop down this forest, and once in the rivers and lakes it can be kept for a longer time than standing dead in the forests. Many other New Brunswick lumbermen will have to send large crews into the woods to cut down burned timber. This means that there will be a heavy demand for woodsmen, and that the cut of the coming winter will be an unprecedentedly large one.

The shareholders of the Consolidated Lake Superior Co. have subscribed a considerable proportion of the money they were asked to raise on bonds to enable the works to be carried on. The directors of the various enterprises, viz., the Algoma Commercial Co., the Algoma Central & Hudson's Bay Railway company, the Algoma Steel company, the International Transit company, the Lake Superior Power company, the Manitoulin & North Shore Railway company, the Michigan Lake Superior Power company, the Ontario Lake Superior company, and the Sault Ste. Marie Pulp and Paper company are identical as follows: James Butterworth, C. Shields, E. H. Sanborn, H. A. Berwind, Samuel Rea, T. C. Search and Jas. S. Swartz. The directors of the British-American Express company and the Tagona Water and Light company are the same, except that the names of Messrs. Butterworth and Swartz are absent from the former, and Messrs. Butterworth and Sanborn from the latter.

Suit has been entered in the courts of the State of Maine by Boston capitalists against the Grand Trunk Railway to recover the sum of \$250,000, the value placed on timber destroyed by fire in June. The owners allege that a spark from a G. T. R. engine started the fire.

John Bertram & Sons, the Dundas manufacturers of machinery, are suing John Stuart of Hamilton, for \$15,000 for a cylinder paper machine made for the Maritime Sulphite Fibre Company of New Brunswick. The defendant was one of the chief stockholders in the concern in 1899, when the machine was sold to the company.

The forests of India are all Government property, and for the past 38 years the greatest care has been exercised to preserve what is considered a most valuable asset. Reforesting is carried on most extensively, and a very large staff is employed to look after these forests. R. C. Milward, of the Indian Imperial Forest Service, is on a visit to Canada, and has been getting pointers on forest preservation. He has already visited Japan and the United States and will visit Germany, Russia, Norway and Sweden, before returning to report. Mr. Milward has his headquarters at Derhrahdu, where the Indian School of Forestry is located. He has charge of a district about 270 miles square, and has 60 natives under him, but in the dry season, when danger of fires is greatest, he has 100 additional men. They are paid from \$2 to \$4 per month. They can live on a few cents weekly. The Government fixes the minimum price for all classes of timber, and then calls for tenders for or sells by auction, such trees as are marked for sale.

The great area of land in Northern Ontario and Quebec that is not only well fitted for grain growing, but is suited for pulp and paper manufacturing, was the subject of discussion in the debate in the House of Commons on the Grand Trunk Pacific Railway. Sir Wilfrid Laurier quoting the reports of the surveying parties recently sent out by the Ontario Government, states the area of the great clay belt of North Ontario at 15,-

680,000 acres, nearly all of which is fit for cultivation. This means an area larger than the cultivable area of the states of Massachusetts, Connecticut, Rhode Island, New Jersey and Delaware, with half of New York State thrown in. This clay belt is traversed by numerous rivers and streams, and large portions are well wooded with spruce, jackpine and poplar. On this feature of the natural assets of the territory, Sir Wilfrid said: "The value of this class of timber, as everybody knows, is increasing every day, and the market for it is widening, and rich indeed is the country which has boundless resources in these varieties of woods. In the district of Nipissing, north of the C.P.R. line, there is estimated to be at least 20,000,000 cords of pulpwood; in the district of Algoma, 100,000,000 cords; in the district of Thunder Bay, 150,000,000 cords, and in the district of Rainy River, 18,000,000 cords, a grand total of 288,000,000 cords. The pine region does not seem to extend much beyond the height of land, but on this side, in the country around Lakes Temagaming and Lady Evelyn, and to the north, an area of red and white pine of fine quality was explored, and estimated to contain about three billions of feet, B.M. A feature of this region, which it is well to note from an industrial point of view, is the existence of many falls in the rivers and streams. These will no doubt be utilized with the advantage in the creation of economical power when the country comes to be opened up. It was not expected, of course, that the parties would be able to make a thorough and exhaustive exploration of all the territory assigned to them, and the estimates here given of what has been reported are very conservative. Totaling up the figures here quoted, however, we have over 25,000 square miles of good fertile land, or over 16,000,000 acres, and 288,000,000 cords of spruce." The corresponding territory in the Province of Quebec is not dealt with in detail in the speech, but explorers in those regions are equally satisfied with the extent of the resources in forests if not in farming land.

BERTRAMS' SCIENNES WORKS.

The Edinburgh Dispatch contains an interesting description of the Sciennes Works of Bertrams, Ltd. It seems that the Bertram family were connected with paper making long before the foundation of the engineering business in 1821 by George and William Bertram, respectively uncle and father of the present managing director, David Bertram. Previous to starting for themselves the founders of the Sciennes firm were employed in the Springfield Mill, Polton, then a mill producing paper—so far as the machine was concerned—by the hand mould system. Their father was engineer in the same mill, and their grandfather was originally engineer in the Esk silk mills, Penicuik. The three great specialties of the company are paper making, linoleum, and rubber machinery. The works occupy 7,340 square yards, and 250 men are employed. The paper machines annually turned out represent 600,000 tons of paper, and vary in size from a very narrow width, for a mill in Central Mexico, to the largest machinery in Europe, at the Clyde Paper Mills, which is only two inches narrower than the largest in the world, in America. The Dispatch states the Sciennes company is now executing an order recently received for what will be among the most important new paper-making machines yet erected in Britain.



CANADA'S WOOD HARVEST.

The extent of the growth of the pulp and paper industry in Canada is well illustrated by the increase in the value of spruce lands in the Dominion. At a sale of Government lands in the Province of Quebec, referred to in the last issue of this magazine, the average price received was considerably more than \$100 per square mile, and it is said by lumbermen who know forest conditions well, that the average value of such lands five years ago was not much above \$2 per square mile. In other instances it is reported that the advance in the

value of spruce-bearing lands has been at the rate of about 50 per cent. per year. There is a big demand for spruce-bearing lands at present, and the Government land officials in Hull report having received recently from one operator something like \$75,000 in one week, for dues, ground rent, fire taxes, etc. This great increase in the value of timber lands in the Dominion has come about through the investment of large sums of United States capital in pulpwood and lumbering operations in Canada. So great is the progress that has been made that the man who was land poor a few years ago is to-day a millionaire, who has simply to take the money which comes to him, and who does not find it necessary to make any effort whatever to increase either his income or the value of his permanent estate.



—The best market for British-made paper is South Africa. Australia no longer takes the lead. The United States has wrested that from us, which is a very unpleasant and not an altogether creditable pill for us to have to swallow. Moreover, the Australian demand has not touched bottom yet; it is gradually declining, and looks like continuing the down-grade movement.—Paper Trade Review.



—The addition of a cipher, though it means nothing when standing alone, may signify a good deal. In an item in our last number relating to the Clergue enterprises, it was stated that the stockholders are being asked to give \$75,000,000 for \$12,500,000 bonds. It should have read \$7,500,000, the bonds being offered at 60. John W. Woffly, one of the largest stockholders, has taken \$50,000, and others have taken liberally. Speaking of the pulp mill, Mr. Woffly says: The sulphide pulp mill, which had been losing money, was in the hands of an incompetent person. It was using twice too much acid, thus spoiling the pulp and incurring great and needless expense. The plant is now making money, being in the hands of competent men.

PULP AND PAPER MAGAZINE OF CANADA.

This is the self-explanatory title of a new monthly of some 80 pages, printed on fine book paper, and published in Toronto and Montreal by that enterprising firm, Biggar-Samuel, Limited. All interested in the pulp and paper manufacturing and trade of Canada should subscribe for it. Canada, we are told, is destined to be the greatest pulp and paper manufacturing country in the world, having the largest supply of spruce. No. 2 (for June) issue contains among many others, instructive articles on "The United States Wood Supply"; "Lord Strathcona on Canada's Pulp and Paper Trade"; "Rainy River Pulp Concession"; "The Coming Wood 'Famine'"; "Profits of Pulp"; "Pulpwood Assets of Ontario"; "Export Duty on Pulpwood"; "Sizing and Coloring of Paper," etc. We believe there is a future for this magazine, especially in such able hands. —Merchant, Toronto.



DURABILITY OF PAPER AND INK.

The public has not yet given much, if any, attention, says the Winnipeg Commercial, to the fact that most of the printed matter of to-day is of a transient character, owing to the lack of durability in the paper and ink used in its production. The wood pulp paper so commonly in use to-day does not possess the enduring qualities which characterized the papers in use in the earlier days of the printing art and most of the great multitude of books, magazines and papers now being produced will in a comparatively small number of years have crumbled into dust on the shelves of the libraries endowed and established to preserve them. It will, perhaps, be better that most of them should pass away, and the world will not be any poorer for this fact, but nevertheless it is important that this contingency should be taken into consideration by those whose business it is to produce the permanent records of this age.

Wood pulp paper and cheap inks should not be used in the production of works which would be valued by posterity. Those who have them in charge say that the books and documents of four or five hundred years ago are quite as legible to-day as when first produced, and that up to about fifty years ago the materials used were of practically imperishable character, but the vast quantity of literature produced during recent times will in a comparatively short space of time become faded and decayed. The danger of losing important records from this cause has come to be fully recognized by most governments and care is being taken to use only papers made from linen, cotton or hemp fibres and inks of undoubted durability in printing or writing state documents. In all well conducted civil services this matter now receives the most careful supervision and tests are applied to all supplies of stationery. Not only the ordinary writing inks are subjected to such inspection, but typewriting inks are also coming in for attention and certain popular kinds have already been pronounced unsuitable because of their fugitive character. All typewriting inks of green, red, violet and other fancy colors will perish in a very few years according to the opinion of the Government experts. Great care is now exercised at Ottawa to see that only permanent inks are used on the machines of the various departments there. These facts have been pointed out here as a warning to the commercial community to see that its books and permanent records are safeguarded in this respect.



PERSONAL.

Forbes Wood, formerly superintendent of the Carew Paper Mills, of South Hadley Falls, near Holyoke, is now superintendent of the Toronto Paper Mfg. Co.'s mills at Cornwall. These mills are now producing bond papers, for which machinery to the amount of over \$100,000 was recently imported.

WOOD PULP INDUSTRY OF CANADA, 1902.

We continue our figures relating to the wood pulp industry as they appear in the Statistical Year Book of Canada:

(From the Statistical Year Book of Canada.)

Quantity and value of Pulp of Wood imported into Great Britain by Countries during the Calendar Year 1901.

Countries.	Quantity.	Value.	Average Price Ton.
Pulp of Wood. Tons	\$	\$	cts.
Chemical, dry—			
Sweden	95,150	3,631,687	38 17
Norway	58,420	2,224,427	38 08
Germany	2,603	106,823	41 04
Holland	3,959	170,333	43 02
United States ..	8,400	308,990	36 78
Canada	20,952	753,077	35 94
Other Countries.	5,174	192,467	37 20

Total 194,658 7,387,804 37 95

Chemical, wet—

Sweden	6,315	179,999	28 50
Norway	9,389	206,206	21 96
Canada	867	25,900	29 87
Other Countries.	393	15,334	39 02

Total 16,964 427,439 25 20

Mechanical, dry—

Sweden	4,617	153,300	33 20
Norway	2,760	81,682	29 60
Germany	84	2,049	24 40
Canada	2,327	70,581	30 33
Other Countries.	5,118	163,563	31 95

Total 14,906 471,175 31 61

Mechanical, wet—

Sweden	9,909	135,921	13 72
Norway	209,872	2,593,650	12 36
Canada	54,377	670,573	12 33
Other Countries.	1,585	13,045	8 23

Total 275,743 3,423,189 12 41

Grand total, ... 502,271 11,709,607 23 31

Imported into Great Britain, 1902*

Pulp of Wood. Tons.	Value	Average Price per Ton.
	\$	\$ cts.
Mechanical, dry. 12,435	322,563	25 94
" wet . 354,025	3,694,223	10 43
Chemical, dry... 207,708	7,337,254	35 32
" wet . 14,740	317,327	21 53
Total	588,908	11,671,367 19 82

*Subject to revision.

Quantity and value of imports of Wood Pulp Board imported into Great Britain during the Calendar Year 1897-1902.

Countries.	Quantity.					
	1897.	1898.	1899.	1900.	1901.	1902.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Russia	62,412	49,646	102,816	206,706	196,269	-
Sweden	90,190	65,576	96,732	108,792	88,574	-
Norway	23,874	26,047	19,927	19,751	25,208	-
Germany	65,250	41,681	44,204	44,000	31,153	-
Holland	3,383	15,397	11,531	9,577	9,648	-
Austria-Hungary ..	3,101	4,580	2,473	2,246	1,462	-
United States ...	55,915	57,998	45,978	48,814	119,768	-
Canada	498	24,755	51,793	82,869	43,662	-
Other countries..	6,010	3,144	1,696	1,322	470	-
Total	310,633	288,824	377,150	524,077	516,214	*

Not specified.

	Value.					
	\$	\$	\$	\$	\$	\$
Russia	130,772	99,022	201,442	408,863	392,419	
Sweden	186,014	137,761	210,551	237,294	180,510	
Norway	48,078	51,523	39,980	39,828	48,720	
Germany	134,963	94,535	97,513	93,897	68,688	
Holland	8,327	29,813	23,112	23,122	20,376	
Austria-Hungary .	8,152	12,663	9,047	6,584	3,158	
United States ...	121,063	133,409	97,489	115,827	250,711	
Canada	1,168	47,655	105,957	166,499	94,603	
Other countries ..	11,110	6,941	3,674	2,881	1,067	
Total	649,647	613,322	788,765	1,094,795	1,060,252	*

Not specified.

*Included in imports of Strawboard and Millboard.

A NOVEL COMPETITION.

The Canada Paper Co. recently introduced a novel prize competition among the employees of their mills at Windsor Mills, Que., to increase their interest in the business, and bring to light any good ideas the latter might have, touching on the paper manufacturing industry. The prizes have been awarded as follows, after keen competition:

First Prize—One week's trip to some paper making centre, with salary and expenses paid, won by Robert Aikin, for suggestions for bleaching and sizing.

Second Prize—Four days' trip, etc., won by W. Hawker, for suggestions for improving the steam plant.

Third Prize—Two days' trip, etc., won by W. Downing, for suggestions for paper making.

Special prizes are awarded to A. Conors, W. Morey, W. Greenley, and J. Laveque. There were, among the suggestions of other competitors, some very good ones, which, however, were not considered practical at present.



At Ouatichouan Falls a large new pulp mill is now in operation.

The By-Products Paper Company, which has a plant at Niagara Falls, N. Y., has discontinued its New York office, and will hereafter transact all its business at Niagara Falls.

B. A. Scott has built a well equipped mill at Roberval, Que., for barking pulpwood.

A London (England) firm asks to be referred to large importers in Canada of rags for paper making. The name of the firm can be obtained from Pulp and Paper.

At Jonquiere an extensive cardboard mill has been built by Price Bros. & Co., for using up the product of the pulp mills at that place. It will be in operation in a few weeks.

At St. Andre, on the Metabetchouan River, another pulp mill is under construction, and a branch line of railway, eleven miles long, has been built, to connect it with the main line of the Quebec and Lake St. John Railway.

Describing the country through which the proposed Grand Trunk Pacific line will pass, a traveller says that from Quebec across country to the north-west, back of the height of land, there is nothing but poplar trees. We question the traveller's accuracy, but poplar makes good pulp.

The Norwegian steamer Protector, which went ashore with a load of pulpwood near the mouth of the Saguenay, and became almost a total wreck, was put up for sale by auction, and brought only \$3,100, being bought in by Gagnon & Frere of Quebec. The cargo of pulp consisting of 2,636 bales, was bought by J. McNaughton, of Quebec, at twenty-five cents a bale.

CHEMICAL PRICE LIST

Bleaching Powder	\$1 30 to \$1 50
Sal. soda	0 75 to 0 90
Caustic soda, 60°	2 00 to 2 25
Caustic soda, 70°	2 35 to 2 50
Alum	1 30 to 1 50
Copperas	0 65 to 0 75
Sulphur rock	1 60 to 1 80
White sugar of lead	0 07 to 0 08
Bich. potash	0 07 to 0 08
Soda ash, 48° to 58°	1 15 to 1 25



—Flax Pulp, Limited, is a company just organized in England to introduce flax pulp to English papermakers.



—The Menzie Wall Paper Co., of Toronto, recently incorporated, to make and deal in wall paper, interior decorations, etc., is also given power to erect and operate pulp and paper mills.



—The Laurentide Pulp company has declared a half yearly dividend of 4 per cent. The capital is to be increased to \$2,800,000, and some new machinery is to be installed.



—The By-Products Paper Co., of New York, has the same object in view in Canada and the United States. They estimate the difference in cost and selling value of flax pulp will show a profit of £10 a ton. Both companies will operate under the patents of the French-Hickman Flax Fibre Co.



—J. C. Langelier, secretary of the Colonization Commission in Quebec, has returned from a trip to the northern parts of that Province, where he found serious complaints against speculation in limits. In the guise of colonization companies, syndicates are stripping the country of its timber and making money from the sale of the same without doing anything to promote settlement. The alleged colonists are really lumbermen, who, as soon as they have stripped off the timber move away.

The Cushing Sulphite Fibre Company, of St. John, held its annual meeting last month, when the following were elected directors: Captain Partington, Glossop, Eng.; C. C. Springer, Thomas McAvity, A. H. Hanington, James Beveridge, George S. Fisher, and W. H. Murray. Captain Partington is president; Mr. McAvity, vice-president; Mr. Beveridge, manager, and H. W. Schofield, secretary and treasurer.



—The American Thread Company has begun the installation of a plant for the manufacture of paper spools. The process of making spools from pulp has been in course of development for the past two years, and many obstacles had to be overcome. It was comparatively easy to mould the spool into the proper form, but after it had become dry and hard the difficulty was to grind or turn it into the proper size to hold the required amount of thread. This trouble has now been overcome. Pulp will be used only for the large size of spools.



The Canada Paper Co. recently installed a machine at their Windsor Mills factory, whose capacity is thus described by a Montreal paper: The paper is 30 per cent. wider than any heretofore made in this country, being 141 inches or eleven feet nine inches in width when first off the machine. The first roll made was afterwards cut into two sheets of about 70 inches each, being the first of this width ever made side by side in Canada. The machine is 200 feet long, and stands in a building 260 feet long by 50 broad. An idea of the wonderful growth of the paper-making industry in this country can be imagined by comparing the changes that have taken place since the present general manager of the company, F. J. Campbell, entered its service twenty-two years ago. The widest sheet made at that time was little more than half the width of that turned out by this very remarkable machine.

The American Sault Paper Co., of Sault Ste. Marie, have invited tenders for the erection of the new plant. J. H. Wallace, of Masonic Temple Building, Sault Ste. Marie, Mich., is the engineer in charge.



In a storm of July 20th, lightning struck Eddy's rag warehouse back of the pulp mill at Hull. The damage done to the building was slight, but about \$3,000 worth of rags were destroyed. The loss was covered by insurance.



Prof. C. E. Anthony, of San Diego, Cal., has patented a process by which he claims ocean kelp can be turned into paper. He says that by his process 85 per cent. of the dry kelp can be transferred into paper pulp and the remainder into potassium and soda. Kelp paper can be produced much more cheaply than that now in use.



The steamer Robert Wallace, an iron boat of the Quebec line, carrying 1,000 tons of pulpwood from the Province of Quebec for the Battle Island Pulp Co., arrived at Oswego, on Aug. 2nd. She had 300 cords as a deck load and 700 cords in the hold, which was immediately transferred to canal boats, for the mill at Battle Island, where there was a shortage of the wood.



The Chicoutimi Pulp Company is building an immense pulp mill at Chicoutimi, which will be in operation in September. The output of this plant will then be larger than any other in Canada. The entire product has been sold in the English market for several years. When the new mill is finished, the capital invested will, it is said, amount to about \$1,500,000.



The water in Lake Champlain is soon to be examined at different places and at different depths by the New York State Board of Health, to ascertain the effect of the discharge into the lake of polluted water from streams on whose banks are located pulp mills. The waste chemicals doubtless cause the death of large numbers of fish and the rocks

along the lake shore are covered with a slime that was never seen before the day of the pulp mill.



—James Murray, provincial forest ranger, for British Columbia, has returned from Quatsino, where he has been examining spruce timber for the purpose of reporting to the Provincial Government whether or not there are sufficiently large quantities of good pulpwood in that locality.



—The Sault Ste. Marie Pulp and Paper company is installing a 15 ton paper plant in the west end of its power house building, Sault Ste. Marie, Mich. The pulp for the mill will be obtained from the company's plant at the Canadian Soo. The plant will be started in September with one machine as an experiment, which it is expected, will lead to the erection of a larger plant later on.

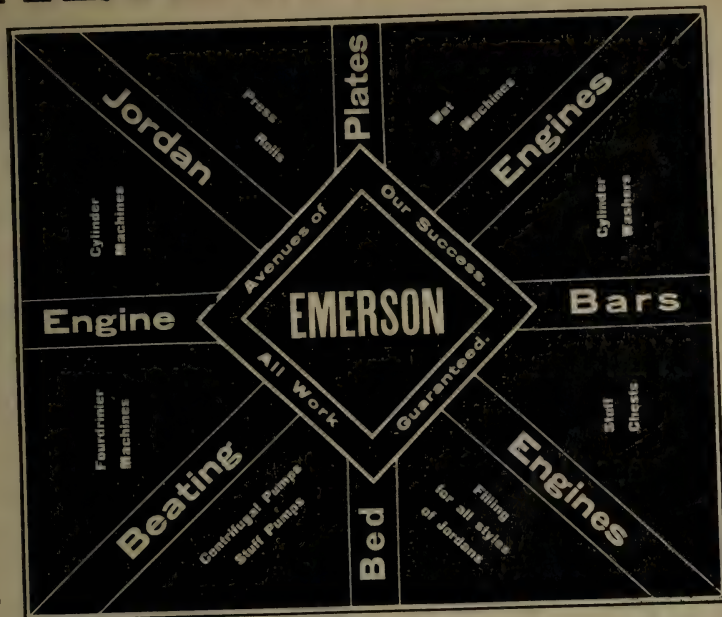


The Acadia Pulp & Paper Mills Co., of Halifax, N. S., which in 1897 acquired the Milton Pulp Co., and Morgans Falls Co., concerns identified with the early exportation of Canadian wood pulp to the British market, and since then did considerable development work, is in difficulty. Its work is alleged to have been impeded owing to difficulties in securing a sufficient supply of pulpwood, though a prospectus issued early in 1902 stated that it had 24,000 acres of timbered lands.



—Among the publications received bearing on the pulp and paper trade, are the Directory of Paper Makers for England, Scotland and Ireland, containing a list of paper makers, mills, classification of makes, trade designations used as water marks, sizes of papers, and much other useful information, published by Marchant, Singer & Co., London, of which there is also a pocket edition; also, a treatise on the Sampling of Wood Pulp, by R. W. Sindall, analyst and chemical engineer to the well known Lloyd Paper Co.

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PAPER STOCK MARKET.

Demand for paper stock continues good, especially new cuttings and waste paper. Wholesale dealers, selling prices may be quoted as follows:

Domestic white rags,	\$2.25 to \$2.35	per 100
Blues and thirds	1.25 to 1.35	" "
Dark cottons	75 to 90	" "
Roofing paper stock	45 to 50	" "
Waste papers	40 to 50	" "
Hard white shavings.	2.00 to 2.10	" "
Soft white shavings .	1.25 to 1.50	" "
Book stock	60 to 80	" "
Manilla rope	2.30 to 2.40	" "
Mixed bagging	60 to 70	" "
Sisal and jute string .	75 to 1.00	" "
Flax tow	1.10 to 1.25	" "

PULP MARKET.

There is no change to note in the pulp market this month. Trade is quiet. Canadian wood pulp may be quoted at \$12 f.o.b. at mill. Of the United States market, the Paper Trade Journal says: From all accounts it seems as if there were but few trans-

actions in ground wood. The price at the mill, however, remains at about \$14. Those manufacturers who happen to be **anxious** to sell some of their stock have sold **pulp** at less than the quoted price. But as the demand is **not** active it seems useless to make low offerings.

In London, England, the market is in a very bad way, and buyers are still chary about giving the low prices which are now being quoted, believing that another drop is imminent. Canadian or American spruce, dry, is quoted £3. 18s. 9d. to £4. In Canada, sulphite pulp may be quoted at \$37 to \$39, with good demand. Pulpwood runs from \$5.25 to \$5.75 per cord, f.o.b. cars.

—It is only a few years since hemlock first began to be used for making sulphite fibre, says a Wisconsin correspondent. Each succeeding year has seen more of it taking the place of the higher priced spruce, until now, a prominent manufacturer says the receipts of hemlock for the coming year will probably exceed those of spruce.

Machinery For Sale.

2 Jordan Engines, in good order; 1 Stack, 39 in., super calenders, in store; 1 Sheet Cutter; 1 Rotary Boiler, 8 ft. x 24 ft., in perfect order; 1 Roll Grinder, will grind rolls 24 in. dia. x 124 in. face, in perfect order; 1 23 in. Leffell Water Wheel, complete; 1 40 in. do., some parts missing; 6 Return Tubular Boilers, 100 H.P., insured at 100 lbs. pressure; 2 Horizontal Slide Valve Engines.

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WOOD PULPS

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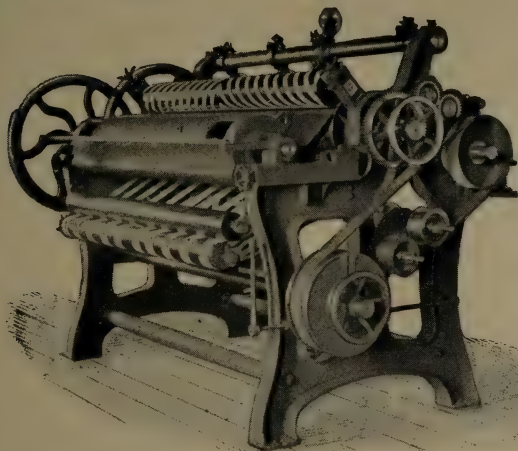
CHRISTIANIA (Norway) ..	Kirkegaden No. 20.
GOTHENBURG (Sweden) ..	Lilla Kyrkogatan No. 20.
MANCHESTER	Guardian Buildings (opposite Exchange).
LONDON	77a Queen Victoria Street, E.C.
PARIS	Rue de Londres No. 29.
ANGOULEME (France) ..	43 Rue Louis Desbrandes.
LYONS	54, Cours Gambetta.
MILAN	3 Via Gius. Verdi.
TOLOSA (Spain)	18 Calle San Francisco.
ST. PETERSBURG	Little Pedjascheskaja House, 4, Qu. 16.
NEW YORK	99 Nassau Street.

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Nova Scotia Wood Pulp Co., Mill Village, N.S.

CANADIAN REPRESENTATIVE :

W. P. RYRIE,

50 BAY ST., TORONTO.

Diaphragm Pulp Screens

A request for our Bulletin No. 507 will bring illustrations of our screens of the diaphragm type, and descriptive matter which will be interesting to prospective purchasers of pulp mill machinery.

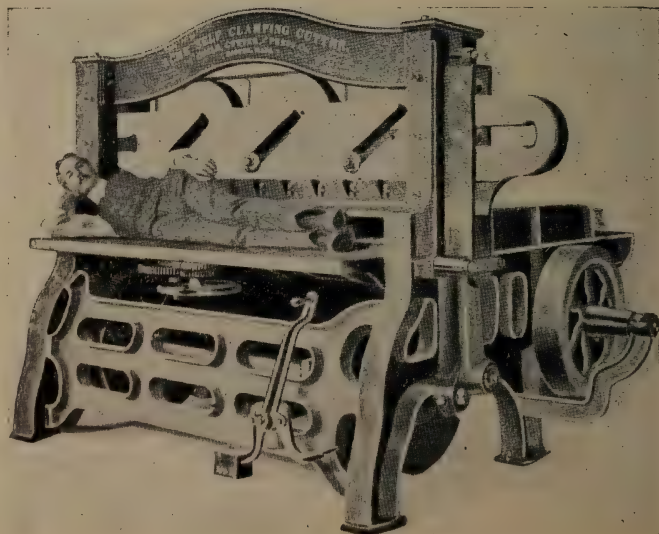
We make these screens for either ten or twelve plates, and fit them with either cast bronze or rolled brass screen plates, as may be preferred, for sulphite or mechanical pulp respectively.

These screens may be seen running in pulp mills throughout the Dominion, and on request we will name nearest mill using them.

Write for full particulars.

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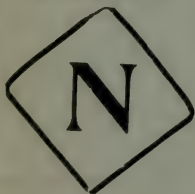
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England.

PULP AND PAPER MAGAZINE

MONTREAL AND TORONTO

Vol. 1.

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United States Pulp Imports.

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NAME PLATES,
PERFECTION BRONZE, DIGESTER CASTINGS and Y VALVES,
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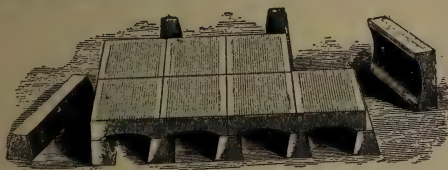
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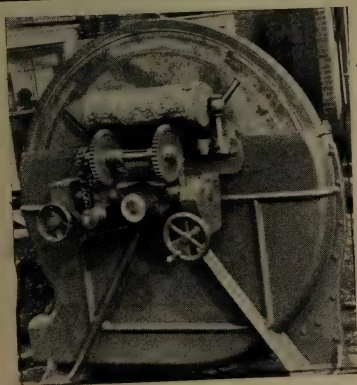
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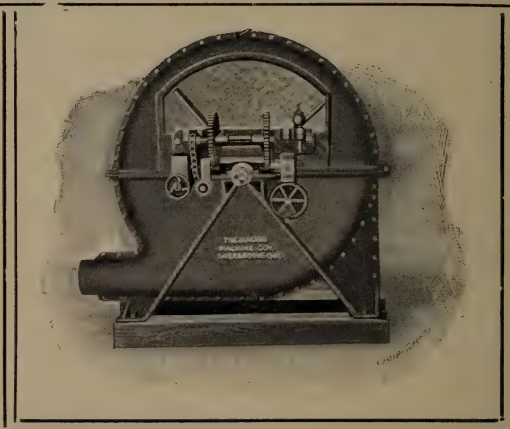
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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 5.

TORONTO, SEPTEMBER, 1903.

{ \$1 A YEAR.
{ SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

SUBSCRIPTIONS: Canada, Great Britain and the United States, \$1 a year; to Foreign Countries, 5s. a year.

Changes of advertisements should be in the publishers' hands not later than the 1st of the month, and, where proofs are required, four days earlier. Cuts should be sent to the Toronto office, by mail, not by express.

BIGGAR-SAMUEL, LIMITED,

PUBLISHERS

18 Court St., TORONTO.

Fraser Bldg., MONTREAL.

—The question of taxing or prohibiting the export of raw materials of the paper industry has become a live one in other countries than Canada. The Paper Makers' Association of Austria-Hungary, for instance, at its recent convention strongly advocated an export duty on pulpwood, and the majority of members expressed the fear that the paper industry must collapse unless some measure was taken to keep the raw material for the home mills.



—The *Moniteur de la Papeterie Francaise* advocates the holding of a paper makers' congress for the world, at Paris, in June, 1904, and suggests as one of the topics some standard for the percentage of moisture in pulp. In view

of the topic suggested, and in view of the future of pulp and paper manufacturing in Canada, we trust our contemporary will gracefully give way to the claims of this Dominion as the gathering place of such a convention. The French paper makers, as well as those of the rest of the world, would receive a warm Franco-Canadian welcome in Montreal or Quebec.



—Mr. Mosely, the organizer of the recent industrial commission of enquiry sent out from England to the United States, speaking at a recent meeting, said his ideal of industry was a minimum wage for the men, interest on capital, maintenance and development funds, old age pensions for all the workers, and then the balance equally divided between capital and labor. Mr. Mosely added that he proposed next autumn to take a new commission to the United States, consisting of some thirty English educationalists, to investigate the educational systems of America. This investigation will naturally bring him to Canada, whose provinces boast of the best school systems of the world. Canada, however, is woefully behind in technical education, and a Canadian

Mosely is wanted to send a commission of this kind to Great Britain and Germany.



—The British Board of Trade returns for the first six months of this year show that Great Britain exported to Canada writing papers, printing papers and envelopes, to the value of £30,731, as against £23,126 in the first half of 1902, and £26,578 in the first half of 1901. In other lines of papers the exports to Canada for the same periods were £7,568 in 1903, £6,211 in 1902, and £6,201 in 1901, a rather slow rate of increase considering the advantages of the preferential tariff. In the case of Australia there is an actual decrease in British exports of the first named class from £202,672 in 1901, to £123,357 in 1903, the United States and other countries having made almost corresponding gains there. South Africa, on the other hand, is the most hopeful sphere of British trade in paper, for the exports for the first half of 1901 were £77,001, of 1902 £102,730, and of 1903 £139,343. Why the British paper manufacturers should make such remarkable headway in South Africa, and so little in Canada, and yet fall away in Australia, is not altogether clear, though there is no doubt something in the statement that South Africans like good qualities of paper and stationery, and are willing to pay for them. It may be worth noting that British shipments of paper to the United States are less than to Canada, being for writings, printings, and envelopes, £13,118 in the first half of 1901, £23,876 in 1902, and £18,263 in 1903. In other classes there is an actual falling off in British shipments to our neighbors.

—Under a slight preference in the British market, such as is proposed by the Imperial tariff reformers, an enormous increase would result in the exports of Canadian made paper as well as Canadian made pulp. Take for instance the trade relations in this line between Great Britain and Russia. Great Britain exported to Russia of all kinds of paper in 1898, 2,612 cwts., valued at £11,203, and this fell to 2,072 cwts., valued at £9,685 in 1902. On the other side of the account British imports from Russia in 1898 of unprinted papers were 86,807 cwts., valued at £47,405, while in 1902 she took 172,362 cwts., valued at £119,812, or more than double. In wood pulp boards British imports from that country rose from 44,327 cwt., of the value of £20,347, in 1898 to 201,943 cwts., valued at £94,884 in 1902. The shipments of Russian paper to Britain appear to be all of the class produced from wood pulp, and apparently a slight discrimination in our favor would turn a great share of this trade into Canadian channels. The increase of manufacturing in Canada which would follow from such new developments would provide a fresh field for British capital under the British flag, while the employment of fresh labor and the opening of fresh resources in Canada would make this country a still larger consumer of British goods in other lines. Thus the development of the colonies in wealth and population would react in an increasing ratio on the trade of the Mother Country, which would in the end gain under the common flag more than she might lose from the hostility of foreign tariffs. But there would be less of this hostility than timid people fear, for sooner or later a desire for

mutual concessions would spring up among foreign nations who must trade with the British Empire, and by means of reciprocity treaties the trade of the world would be restored to a more natural balance. This will be a shorter cut to universal free trade than can be brought about by Britain attempting to stand alone—to use the words of the British Premier—a free trade nation in a world of protectionist nations.



—In common with our trade contemporaries we were inclined to make light of the process for making paper out of cornstalks. Few would doubt that it could be done, but the supply of the raw material appeared to be too limited, and the difficulty of manipulating it appeared to be great. We learn, however, that S. D. Warren & Co., the large New England paper manufacturers, have made some experiments in this line, and though they have no intention of starting a cornstalk paper mill, they have shown that paper can be made from this raw material; and its successful production is more a problem of inventing machinery adapted to the case than of getting sufficient raw material to keep such a mill running. On this point they are of opinion that sufficient cornstalks could be grown within a single county to keep a 60-ton mill going the whole year round. As to the product, cornstalks would appear to be particularly well adapted for parchment papers and papers for air-proof and water-proof wrapping. It would not, therefore, be a competitor of news and other wood pulp papers to any dangerous extent, but would fill a special field of its own. A company was recently formed in Chicago claiming to have

elaborated machinery for the production, on a commercial scale, of cornstalk paper, but we have not heard that they have so far produced anything more than samples, which have been favorably spoken of by paper men. The part of the maize plant most suitable for this purpose is not the strong husk enveloping the ears of corn, but only the main stalk itself.



LOADING AND COATING.

SOME OF THE MATERIALS USED IN THE MANUFACTURE OF PAPER.

Loading paper is a legitimate process when certain kinds of paper are required, especially so in the case of the highly glazed art paper that has recently found so much favor for illustrated magazines. The substances usually employed are white clay, such as kaolin, which is also known as china clay, because it is the clay used in the production of porcelain; gypsum, which is a native sulphate of calcium, also known by the name of pearl white; barytes, which is a native sulphate of barium, more generally known in the paper trade as blanc fixe; magnesium silicate, which is classified among minerals as steatite or soapstone. Although obtained from natural sources, these substances vary greatly in their qualities, and, although cheap, are not infrequently sophisticated by various means. The use of an adulterated article is a serious matter to the paper maker, because he may spoil a whole batch of pulp by the immersion of something which is not what he supposed it to be. Not only so, but he is also being defrauded by paying the price of a pure article for something which is not pure. With the view of protecting the paper maker against fraud of any kind, the following facts will commend themselves to the reader.

To render these materials fit for use in paper making, they are usually made into a thin paste with water, and then such paste put into the beating engine,

containing the stuff, whereby it becomes commingled with the paper pulp. The quantity of loading material used depends on the quality of the fibre, and the nature of the particular kind of paper to be made; three to fifteen per cent. is the usual proportion, anything above may be considered as being added for giving weight to the paper, and thereby it becomes an adulterant. The object of adding the loading material is to close the pores of the paper so as to give it a smooth surface, and at the same time a stronger texture than would be obtained without the presence of some loading material.

Blanc fixe occurs naturally as barytes, barite heavy spar, or in crystals of the orthorhombic series. Not unnaturally it may be stained with salts of iron and contaminated with grit and earthy debris. Chemically, a similar substance is obtained by dissolving a soluble salt of barium by means of a sulphate of another metal or alkali, such as the addition of sulphate of alumina, sulphate of soda, etc., whereby the soluble barium salt, usually the chloride or nitrate, is converted to the soluble sulphate of barium. Such a precipitate is known as precipitated sulphate of barium, and is used in the paint trade as barytes white, etc., under the name given above.

Such a chemically produced barium sulphate is of a much more amorphous body, and less crystalline than the native thing, for no matter how finely the latter may be ground, it never loses its crystalline structure, and if examined under the microscope would appear like white sand. The impurities naturally present in the native barytes are: silica, iron, alum, etc., which give it an impure white or gray and brownish tone. The presence of these ingredients would interfere with the whiteness of the paper, and is therefore undesirable; consequently all samples of blanc fixe should be tested for the presence of such bodies before use.

The symbol for this body is BaSO_4 , and although it is of a crystalline nature it does not possess any water of crystallization like sulphate of soda, sulphate of

calcium, etc. The specific gravity is 4.3 to 5.02. The following analyses show the composition of two varieties of barytes, namely, the opaque and the crystalline kind.

Opaque variety.—98.796 per cent. barium sulphate (BaSO_4); .211 per cent. ferric oxide (Fe_2O_3); .767 per cent. sulphate of calcium (CaSO_4); .226 per cent. of magnesium (MgO).

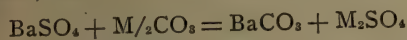
Crystalline variety.—98.566 per cent. barium sulphate; .830 per cent. ferric oxide; .504 per cent. sulphate calcium; .017 per cent. magnesium.

When found fairly pure it requires but little preparation except grinding, to fit it for use, but to free it from gritty particles it should be levigated. The purity of barytes may be tested by boiling it in a little hydrochloric acid in a test tube; if entirely pure it will be completely insoluble, without effervescence; if any effervescence occurs, that indicates the presence of a carbonate, either of barium, calcium, magnesium, etc. It should be white in color; if of a faint yellow color, iron may be suspected, and the samples should be tested for that article.

To test for the presence of soluble (pearly) bodies, put 100 grains of the barytes into a clean test tube, cover it with hydrochloric acid, and heat the mixture until the acid boils; then allow to cool, collect the insoluble portion in a filter, dry it, and then weigh it. If there is a loss in weight the difference will show the amount of soluble matter present. If there be no loss in weight, perform the following test: Mix the insoluble barytes with a mixture of carbonate of potash and soda, fuse in a porcelain crucible until red hot, then allow to cool, and pour water on the cooled mass, and allow it to stand an hour or two; then pour off the aqueous portion from any remainder and add hydrochloric acid until the fluid is acid; then gradually from a burette pour a solution of barium chloride until a white precipitate ceases to be given; collect this precipitate, wash and dry it, and then weigh. If the sample of barytes originally taken be a pure one, the weight

of this white P. P. should equal the weight of barytes originally taken.

By fusing the barytes with the salts of potash and soda it is converted into carbonate of barium, which is soluble in acids, thus:



Barium Sulphate	Fusion Salt.	Barium Carbonate	Sulphates of Potash and Soda.
--------------------	--------------	---------------------	-------------------------------------

The soda and potash sulphates are dissolved in the water into which the fused mass is put, when insoluble barium carbonate is left behind. This is collected, washed, dried, and dissolved in HCl acid, and precipitated as above; or it may be dissolved in the HCl acid, precipitated with sulphuric acid (as BaSO_4). The weight of BaSO_4 thus obtained should be equal to the weight of barytes originally taken. If this weight be not equal you will know that the sample is not pure.

To render the crude barytes fit for use in various industries it requires a certain amount of manipulation to render it free from adventitious matter. If the sample is very pure it will require nothing more than grinding to a very fine powder for use, but otherwise it has to be carefully inspected and the pieces containing lead ore (with which the barytes may be mixed) picked out by hand; so likewise with the lumps that are discolored or otherwise contaminated. The general process of treatment of the crude barytes is the following: The lumps of barytes are looked over and the impure lumps removed; then the remainder is ground to a coarse powder under edge runner mills, and afterward put under flatstone mills and ground still finer; the powder thus obtained is passed into settling tanks (usually constructed of stone) to wash it.

Owing to its heavy specific gravity it soon settles down to a somewhat coherent mass, from which the superabundant water is syphoned, or run off by stop-cocks. As the coarse particles will be the first to be deposited at the bottom of the tank, the finest barytes will form the top of the layer; this fine barytes is removed and stored, ready to be

further operated on; the lower strata of coarser particles are then put again into the grinding mills and reground, and the operation of settling repeated. The next step is to remove any yellow tinge from the barytes, such tint usually being due to the presence of oxide of iron, from which the barytes is seldom free. For the bleaching process stone cisterns are used, varying in size according to the quantity of barytes to be operated on at one time. To this cistern a steam pipe is fitted, so as to heat the contents, which facilitates the bleaching process.

The wet barytes, fresh from the settling tanks, is put into these cisterns, and heated up to nearly the boiling point; then some hydrochloric acid is put into the tank, the quantity being regulated according to the amount of iron oxide in the barytes, the larger the amount of oxide the more acid being required; an average quantity is about 1 cwt. acid per 1 ton of the crude barytes. This acid extracts the oxide in the form of a chloride which is soluble in water, and consequently can be washed out of the barytes, thereby leaving it white. Any carbonate of barium, calcium, iron, and manganese, etc., will be dissolved out by this acid; such carbonates will set up effervescence in this cistern when the acid is added.

It is quite feasible for the paper maker to bleach his own barytes, provided he uses stoneware tanks or vats of acid proof cement. To effect economy in working it will be found best to treat the barytes to two lots of acid; the second lot can be used as the first acid for a second batch of barytes, the first acid being run away, or if it contains much chlorides of metals they can be precipitated as sulphate of calcium, etc., by adding sulphuric acid. It will not pay to do this, however, unless the hydrochloric acid contains an appreciable amount of precipitable chlorides. Instead of wasting the first lot of acid, however, it could be utilized for improving the color of inferior samples of Prussian blue by mixing it with the mass of greenish blue P. P. obtained by the

mixture of ferrous sulphate and yellow prussiate; the HCl in such case will convert the ferrous salt into a ferric salt and thereby produces a Prussian blue pigment at once, instead of waiting for the above mixture to become converted into Prussian blue by oxidation on exposure to the air.

After the acid treatment of the barytes, it is allowed to settle, the acid liquid poured off and the deposited barytes washed with water; the barytes is again allowed to settle and the wash water poured off, and the washing repeated two or three times. When a very fine quality of barytes is required, it is as well to levigate the barytes so as to separate the finer particles from the coarse ones, the latter being returned to the grinding mills. Barytes in a very fine state will occupy about three hours to settle from the wash waters; after the last wash water is drawn off, the barytes will be left as a stiff paste, containing from 25 to 30 per cent. of water.

To remove this water the barytes is dried in drying ovens. The drying operation is usually conducted in two stages. After removal from the settling tanks, the barytes is thrown on top of the drying flues, such flues running horizontally round three sides of the drying-shed, one end being connected with a furnace and the other with a chimney. These flues are about thirty inches square, sectional area, the sides being formed of brick and the tops of flagstones. The barytes placed on top of the flues is allowed to dry until it becomes sufficiently coherent to allow being cut up into bricks.

These bricks are then transferred to the drying ovens, which are large chambers built of bricks, and in the centre of which is a furnace which is so constructed that it can be fed with fuel from the outside. In some works there is built in the centre of the chamber a large globular-shaped vessel of iron which is in connection with the furnace, so that it may be heated to a red heat; this vessel, which is generally known as the "balloon," consequently increases the

temperature, and therefore adds to the drying process of the stove. Ranges of skeleton iron shelves are built around the sides of the stove and over the furnace and bottom, and on these shelves slabs of barytes are placed after removal from the tops of the drying flues, and kept until perfectly dry. Such operations occupy several days.

When the barytes is perfectly dry it is ground to a fine powder and packed for sale. The kind of barytes called "floated barytes" is essentially the same as ordinary barytes, except that it has been specially prepared by a levigation process, which consists in having a series of tanks arranged in a row, one slightly below the other; the barytes is put into the higher tank and water is poured in, and stirred up, and when one tank is full its contents flow into the next, and so on through the series. By this arrangement the coarser and heavier particles will settle in the first tank, the next finer and less coarser particles will settle in the second tank, while there will be still finer particles of barytes settle in the third and fourth tanks. Of course the finer the particles the longer they will take to settle.

The finest ground native barytes is never free from a gritty feel due to its crystalline nature. Alkalies and acids will not dissolve it, which affords a ready test of distinguishing it from all other white pigments. When mixed with other pigments, barytes is perfectly inert toward them, that is, it does not chemically react on, nor is reacted on by, other pigments, oils, or vehicles, and for this reason it obtained the name of "constant" and "permanent" white. Although the composition of barytes is BaSO_4 (sulphate of barium) the native variety is seldom free from oxides of iron, silica, and alumina, which are usually present to the extent of almost 1 per cent.

Artificial barytes is obtained, as already explained, when solutions of a soluble salt of barium are mixed with sulphuric acid, or with a solution of a soluble sulphate of some other body. A dense white P. P. falls down, which,

after washing to free it from acid, forms a pasty mass containing 70 to 75 per cent. of barium sulphate, the remaining percentage being water. It is in the pasty form that it is purchased by paper makers, consequently it is worth while for the purchaser to test it as to the percentage of water; this is easily done by weighing up 100 grains of the paste barytes and drying in a drying oven to draw off all moisture, allow to cool, and weigh again, when the difference will indicate the percentage of water present in the paste. Owing to the cheapness of barytes it is not worth while adulterating it, as it is cheaper than all other white substances. Its specific gravity is heavier than white lead, and being insoluble in acids, it is easily distinguished from other whites, except kaolin.

To test barytes for the presence of kaolin, boil a weighed quantity of the sample in sulphuric acid for some time, in a test tube or a glue flask, and after prolonged boiling collect the insoluble residue, wash it to remove all acid, then collect, and dry it, and weigh again. If this weighing is the same as the first, that indicates the purity of the sample as being entirely BaSO_4 . If kaolin has been mixed with the sample, that white body will be dissolved out by the acid, and will exhibit itself as a gelatinous residue in a solution of sulphate of alumina; consequently by removing this kaolin from the barytes any difference between the first and second weighings will give the percentage of barytes and of the kaolin present in the sample.—Paper Makers' Circular.



TECHNICAL EDUCATION IN THE BRITISH PAPER TRADE.

The paper making and textile departments of the Manchester Technological College—an institution of which Lancashire may well be proud—were opened in July. This technical college has a complete paper mill plant where the processes of paper making are demonstrated; and a separate branch is devoted to the teaching of the chemistry

of paper making. It is gratifying to learn also that owing to Lord Rosebery and several public-spirited citizens of London that metropolis will soon have a technological institute comparing favorably with the technical institutions in Germany, which have done so much to place that country on such a high level in the industrial arts. Among the first pupils of the new Manchester Institution are sons of James Marsden and Joseph Dixon, two well-known English paper manufacturers.

The Paper Maker, of London, referring to the opening of the college, has this criticism to make:

"Surprise and regret were expressed that the paper-making section at Manchester does not contain a typical paper-making machine of British manufacture. We should be sorry to say anything to the detriment of German paper-making machinery, and it would be idle not to admit that the Germans can make excellent paper machines, still, British engineers do feel that some explanation is due to them as to why they were not given the opportunity of submitting drawings and of making machinery in what is, after all, a history-making institution. Probably, as the paper-making department grows, this may be remedied, and, candidly, we should like to see our engineers properly represented there. There is no doubt that the Manchester paper-making lectures and demonstrations, with such an excellent man as Professor Julius Hubner at the head, and with a perfect model plant available for demonstration, may do a great amount of good."

The name mentioned in this extract would indicate that the college went to Germany for its principal professor in paper-making, and it is quite natural that the professor would prefer machinery of German origin. Such a preference may arise from an attachment to the methods and processes under which one has been educated, or from a desire to do a good turn to friends with whom one has been associated in trade, or from a conviction that the machine selected is the best that can be had. But

it would be nothing to marvel at if the considerations first named influence a teacher unconsciously. We find this the case in the introduction of new machinery in the pulp and paper trade of Canada. If the designer and superintendent of the plant comes from the United States, there will be a strong recommendation to adopt American machinery and methods; if from Great Britain or Germany or Belgium, the preference will generally be given to the machinery of those countries. Here and there a man is always ready to rise above the bias of his experience, but this power of detachment from one's environments and associations is not a gift that distinguishes professors from other men. This has no necessary reference to Professor Hubner, whose instructive lectures have interested our readers in the past three issues; but a knowledge of facts is one thing, and judgment in using those facts is another, as our experience sadly teaches us sometimes when we repose our full confidence in a lawyer or doctor with a string of imposing titles to his name.



SILK FROM WOOD.

John E. Kehl, United States consul at Stettin, writes as follows: "I have seen samples of imitation silk for weaving purposes manufactured from wood. It is an English patent, granted to C. H. Stearn, 47 Victoria Street, Westminster, London. The rights for the United States, Germany and France have been sold. Prince Henckel-Donnersmarck has purchased the German rights, and has just completed the erection of a plant at Sydowsaue, about five miles from Stettin. My informant says that the plant is at present turning out fifty pounds of skein silk per day, which can be increased to a daily output of 2,000 pounds. The sample shown me was very soft and of a cream color. Each thread is made up of eighteen single strands. A single strand is hardly perceptible to the naked eye. As to the relative strength of a real silk thread and this imitation, the real

silk is two-thirds stronger. It is said to take coloring or dyeing readily, and when woven into pieces has the appearance of real silk. Wood silk seems to have a great demand. I was told that within the last ten days the price jumped from 16s. to 28s. (\$3.89 to \$6.81) per pound. How this new artificial article compares with the genuine, in the way of wear and price, I am unable to say. It is impossible to get samples here, or information as to the process of manufacturing, excepting that no particular kind of wood is required, and that the pulp undergoes a chemical process and is pressed through very fine tubes by hydraulic pressure, forming the single strands which go to make up the thread."



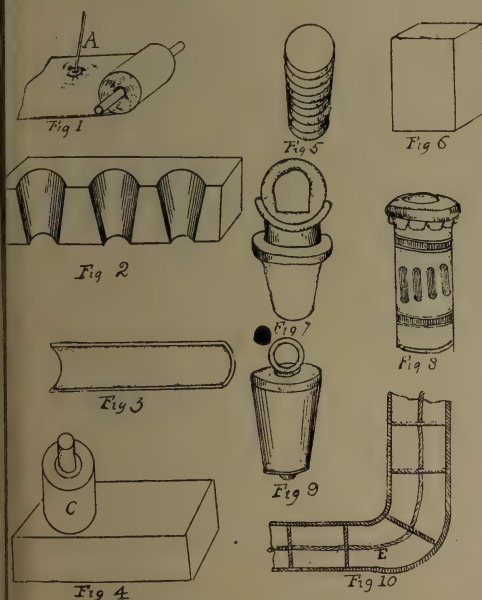
Pulpwood and wood pulp received at Nantes (France), in 1902, amounted to 29,630 tons, an increase of 814 tons compared with 1901, and a decrease of 6,879 tons compared with 1900. The countries of supply were Russia, Sweden, and Norway.

Representatives from the Royal Paper Mills, East Angus, Brompton Pulp and Paper Company and other concerns doing business on the St. Francis River, met to consider whether it would be better to build a new dam at the outlet of Lake St. Francis or repair the old one belonging to the Royal Paper Mills Company, in existence for over fifty years. It is understood that the result of the conference favored the repairing of the old dam at Two Miles Falls, in the vicinity of Weeden. These dams are constructed for the purpose of regulating the flow of the river. The problem of the water supply is becoming a serious one to the lumber merchants and mill owners along the St. Francis. The present season, as well as that of 1902, has been a remarkably dry one. Many of the small streams feeding the St. Francis have dried up as a result of the opening up of the country, and the mill owners realize that they must grapple with the serious problem of storing in the lakes above greater quantities of water for use during the dry season.

PAPER CORKS.

A travelling correspondent of the Paper Trade Journal sends the following interesting review of the various methods of making paper corks in different parts of the world.

Paper pulp has been used for paper cork manufacture for quite a number of years in some of the older countries, such as England, Spain, etc. But the processes have been crude, and the devices used of an inferior nature. The processes were chiefly of an experimental character, and paper corks were not often found for sale in the open markets. Nowadays one finds the paper corks for sale in liberal quantities in many of the commercial centres of the world. It is of these paper stoppers that I now write.



The paper stopper of olden times was chiefly a collection of pulp stuff, compressed into a form with molds, and utilized without much preparation. The paper corks of to-day are both molded and cut out. The corks are treated with compositions that prevent them from absorbing liquids or moisture, thereby avoiding the presence of odors. The processes of paper cork making as noticed by the writer in American, Eng-

lish and Japanese shops are illustrated in the annexed views. The writer travelled through Japan and saw some of the uses to which the Japanese put paper and paper pulp in cork molding. The Chinese also make paper corks, some of which are molded and some are rolled. In Fig. 1 is shown one of the processes of shaping the corks from cylindrical devices. The operatives use plain pieces of manilla or other paper. The paper is wound from a roll onto another cylindrical form, with considerable glue or paste daubed on between the sheets as at (a). A common brush is employed for this purpose. After the tube of sheet cylinder paper is rolled tightly to about the diameter of the proposed corks, it is dried and then chopped to the proper lengths. Then the tubes are pressed in molds. The molds are in two sections, and are made of wood or metal, properly hollowed out for the corks, the sides being fastened together with bolts. The compressing effect due to the buckling serves to squeeze the corks down to required pattern. The form holds to its pressed shape, and the cork is finished. In Fig. 2 is shown one of the molds used for shaping corks from pulp. Both wood and paper stock pulp are used. Rag stock pulp is likewise employed. In fact all kinds of pulp can be used. The molds are fitted with gates and runners for receiving the liquid pulp. The pulp is poured into the gates, and the runners convey the substance in each cylindrical opening for forming the stopper. The mold sets the pulp in a little while, and the corks can be removed for future treatment. In Fig. 3 is one of the shell molds shown in section. Some of the corks are molded on mandrels.

One odd form of stopper manufactured from paper stock is exhibited in Fig. 4. It consists in the molding of the corks from pulp on a mandrel. The paper pulp stock is worked to a puttylike form. Then it is pasted about a mandrel on a block as represented by (c). Pretty nearly the complete formation of the stopper is shaped in

this process. The circular form, the proper length, etc., have to be worked out with properly shaped tools. These consist of a trowel affair, two or three scrapers and finishing tools. The corks are made hollow, in order to prevent the corks from caving in or depressing on the hollow, there is a second mandrel inserted, which mandrel is usually a little piece of round wood, like a pencil, and this is left in the cork.

I also noticed that some of the paper cork makers were manufacturing a style of disk cork like that presented in Fig. 5. This cork is made by building up a series of disks, one above the other, and secured together either by a pin running through the middle or by glutinous substances. The disks are chopped out by the wholesale by using stamping contrivances made of the metal piping with one end sharpened to a cutting edge. Boys with wooden mallets do the work, and cut out quite a lot of disks in a short while. The disks are placed in molds to get the proper form, and when dry are glued or pegged, and then when the cork is beveled by grinding, and the exterior polished, it is finished. The grinding is done on emery wheels or sand covered wheels revolved by foot-power or by machine power.

It is chiefly in Japan that the carved corks are made from paper pulp. The Chinese and Japanese engravers can be hired for a few cents per day. The engravers take the solid block of cork, as shown in Fig. 6, and cut it down to proper size with their crude tools, and then form some style like that in Fig. 7 for illustration, or perhaps like that in Fig. 8. There is quite a lot of carving work to be done, but time is not very important to these people. They will work for hours on the design. They will carve all sorts of original effects, some of which are exceedingly good. These corks find ready sale in all parts of the world.

The cork makers of Spain manufacture a paper cork with a wire inserted through the centre, riveted on the under side, and fitted with a ring of

metal at the top. This is handy for pulling the stopper at any time. This style is shown in Fig. 9.

Fig. 10 is a sketch of a rather queer form of cork, made with an elastic coating, and packed with paper pulp stock. The exterior is rubber, and the sections are made with wood disks, while a cord extends through the centre. Each chamber is packed with pulp as the tube is made, and an elastic form of stopper results.



SUPERHEATED STEAM IN DRYING CYLINDERS

A writer in the German paper, *Der Papier Fabrikant*, says:

Our knowledge of steam engine construction enables us to build steam engines at the present day which, when subjected to an increase of even 90 per cent. above normal duty, do not vary more than 2 per cent., and that only for two revolutions at the most. This, and the completeness also of our modern electric driving machinery, is so well worthy of consideration that it is only in quite exceptional cases that it is expedient to turn to other means for driving paper-making machines, the more so, as will be shown hereafter, that heating by means of waste steam does not possess the great advantages ascribed to it. Nothing can be said against the heat theory, it is true, and it is quite correct that steam at six atmospheres pressure contains 656 calories, whereas steam at one atmosphere still contains 637 calories, so that only 19 calories are used in performing work, whereas the remaining heat, with a direct exhaust, is entirely lost.

Even the application of condensation, which saves about three-quarters of an atmosphere, does not in any way accord with the great loss of heat. The following conclusion, which I have heard even well-trained experts make use of, is, however, utterly wrong, viz., "That as steam at two atmospheres pressure, such as is generally used for heating purposes, contains only 646 calories, whereas exhaust steam contains as much as 637 calories,

the difference of nine calories cannot possibly play any part in the heating of the cylinders." These gentlemen, too, often carry their views on this point into practice to the extent of reprimanding or even fining the machine man for using live steam in order to obtain a good product. The machine man knows nothing about the theory of heat, but he does know that exhaust steam is no use to him, and the man is right.

To make the matter properly intelligible, we cannot in the present case start from the difference in the number of calories, but must take the difference of temperature between the two steam pressures into account. Steam at two atmospheres over pressure has a temperature of 130 degs. C., while exhaust steam, owing to the length of the pipes, is never more than 99 degs. C. The difference between these two temperatures when compared with each other is really not very great, but an important fact which has to be considered is that water is only converted into steam at 100 degs. C., so that in the present case the numbers which we really have to compare are 0 degs. and 30 degs. Water which escapes before the temperature reaches 100 C. is merely water vapor, and, as such, valueless. Theoretically, of course, the increased evaporation at higher temperatures may be explained by the well-known law of Gay-Lussac, which states that all gases expand by 1-273 of their volume for each degree rise in temperature. An increase of temperature to 30 degs. corresponds, therefore, to an increase of volume of 30-273, which is equal to about 0.11 per cent.

According to Boyle's law, the volume of a gas is inversely proportional to the pressure to which it is subjected, or, in other words, the greater the pressure the less the volume. A gas which, at normal pressure, occupies a volume which may be denoted by 1, will occupy only one-half or one-third of that volume, according as the pressure is doubled or trebled. In my opinion a pressure of 0.11 atmospheres will promote proper evaporation. In modern paper-making machines, where the drying is quite slow,

exhaust steam may be used to dry paper, but in the older machines, the drying end of which is only small, and which, notwithstanding, have to turn out more and more stuff each year, exhaust steam is not and cannot be used. It is quite obvious to anyone that an enormous drying surface would be needed to condense all the exhaust steam in the cylinder; and again, where this is not done, and the exhaust steam allowed to escape from the rear end of the cylinder, the utilization of the heat is extremely bad, the whole of the internal heat of evaporation, which is really of most value, being lost.

Lastly, it must not be forgotten that where exhaust steam is used, the condensation water must be removed by a scoop, bolted or cast in place, and not, as is so frequently the case, by a downwardly bent tube. In the latter case the water must be properly separated from the exhaust steam, which works back towards the machine, or else the cylinders become half filled with water, and every paper-maker knows what that means. Where frequent stoppages are made, changes in speed, and when starting a thick paper, the irregularities of the front cylinder become so flagrant that many hesitate to utilize exhaust steam in this way, where it can be otherwise employed.

Again, exhaust steam is useless for heating the felt dryers. Our modern paper-making machines are now so constructed that the front of the dry end must have an equally large felt dryer for each two cylinders, and where such is not provided, or exhaust steam used from motives of economy for heating the dryer, this inevitably causes an enormous consumption of drying felts. Paper-makers who require steam can utilize the heat of the exhaust steam much more profitably for heating boiler feed water than for heating cylinders. In well-constructed pre-heaters worked on the counter current principle 70 per cent. of the total heat of steam, which has already done work by its expansion, can be utilized at the present day; or, in other words, about 450 calories can be

got from the exhaust steam, a result which can never be obtained from cylinders, as the condensation water always escapes at a temperature of 85 degs. under the very best conditions possible. A paper mill possessing a paper-making machine worked entirely by steam power will require for driving, drying and heating at least 3,000 kilos [a kilogram is 2 1-5 lbs.] of steam per hour, e.g.:

200 h.p. \times 6 kg. = 1,200 kilos for effective work.

40 h.p. \times 12 kg. = 480 kilos for driving the machine.

400 h.p. \times 3 kg. = 1,200 kilos for drying the paper.

120 kilos for miscellaneous purposes.

Total, 3,000 kilos.

By means of this exhaust steam, and also that from the main engine, the whole of the feed water can be heated to a temperature of 90 degs., and there will still be a sufficiency to spare to heat the ceiling of the paper machine room. From the above remarks, however, the advantages of super-heated steam for heating cylinders will be quite obvious, for this steam at a low pressure, and which consequently can have no dangerous action on the drying cylinders, possesses a temperature which readily effects rapid drying. Seeing that superheated steam is employed in steam engines with satisfactory results, and that only little steam is required, which materially reduces the call upon frequently overtaxed powers of the boilers in small works, and which also includes a very substantial saving of fuel, I think the above remarks may serve as an indication of how many mills may reduce their expenses.



FOREST FIRES.

At the recent annual congress of the Boards of Trade of the Maritime Provinces, held at Charlottetown, the subject of forest fires and forest preservation was discussed. B. H. Dodge, M.P.P., of Kentville, N.S., said that forest fires were a very serious thing for his Province, and that the cut there this coming winter would be wholly from

burned timber. He thought the matter should be taken up by the Governments of the three Provinces.

W. S. Loggie, M.P.P., of Chatham, N.B., said it was a grave question for his Province. He referred to the recent meeting of the lumbermen called by the Surveyor-General of the Province to discuss the forestry problem. In his opinion the timber is cut to too low a limit of size and growth. Of course, the law protects the young trees, but timber operators are not in all cases scrupulously careful to observe the law. The Government of New Brunswick, according to Mr. Loggie, does not find it practicable to enforce the law. Double stumpage dues are the penalty for cutting trees below the legal limit, but they are never collected. Timber men say it pays better to haul undersized logs than to pass them by.

Messrs. Dodge, Loggie, and McLeod were appointed a committee, and drafted the following resolution for submission to the Provincial Governments:

"Whereas, There have recently been devastating fires in our forests and timber lands; and whereas, The laws against such fires are either insufficient or inoperative; and whereas, so much depends upon the preservation of our lands; therefore,

"Resolved, that in the opinion of this board the time has fully arrived when some practical measures should be taken by our local Governments to prevent the destruction of our forests by fire, either by the appointment of special guardians, or such other means as they, in their opinion, believe will attain the desired object. And further resolved, That it is most desirable that the laws made, or hereafter to be made, regarding cutting undersized sawlogs, be strictly enforced."



WATER POWER AND FORESTRY.

Mr. A. T. Drummond writes to the Toronto Globe. In the article in your Saturday's issue on "Preserving Forest Wealth," you brought up a very important question when discussing the de-

forestation of Canada. Waterpower is one of the natural features of Canada, and in consequence of its easy transmission, electrically, over long distances, it will play, year by year, an increasing part in our manufactories all over the country. To keep this waterpower from continually running to waste with the spring floods, to the detriment or exhaustion of the summer supply and the erosion of the river beds, is one of the problems in all of the rivers of Canada, large and small, to-day. The depletion of the forests by fires and by continuous, exhausting lumbering operations has greatly intensified this problem. To conserve the forest is then in the interests of not only the Crown revenue, to which they contribute so much, and of the home and export trade, of which lumber forms such an important item, but of the great manufacturing industries and the street and suburban railways, which yearly more and more will use the power of these rivers.

You refer to the effect of the removal of the forests on the level of the great lakes, and more particularly of Lake Superior. The peculiar physical conditions in and surrounding this lake make it evident that its level will be maintained. The water is not only very deep, reaching below the Atlantic level, but it is very cold, even at the surface, during summer. The effect on the climate of its shores is seen in the existence of some semi-Arctic plants there, although they are not found inland. The coldness of the water leads to a light evaporation from the surface of the lake, whilst, on the other hand, the rainfall there is not below that of other parts of Ontario. The total area which receives this rainfall, tributary to the lake, is probably nearly two and a half times the area of the lake. Further, in connection with all of the great lakes it must be remembered that evaporation from their surfaces is very much less than on the surrounding land.



The British Columbia Government has declined to remove the export duty on logs going to the United States.

WORK OF THE DOMINION FORESTRY DEPARTMENT.

E. Stewart, Dominion Land Surveyor and Superintendent of Timber and Forestry in connection with the Department of the Interior at Ottawa, speaking of the work of his department, which has been organized for years, says: "To guard against forest fires, we have established a system of patrol by what are known as Forest Rangers. A number of these are appointed in each province. These men, although not on duty continually, are always ready to turn out when their services are required. Each fire ranger has his allotted territory to go over at brief intervals during the dry season. In the winter they post fire notices in the vicinity of every logging camp and trail. The fire rangers also distribute copies of the Fire Act, and warn people going through the trails against the dangers of leaving campfires burning when they leave. In looking after the enforcement of the regulations of the Fire Act and the prosecution of any infringements, they also render valuable services for the preservation of timber. I am pleased to say that the works of these fire rangers has been very satisfactory, and the immunity which British Columbia has enjoyed from any serious fires for the last few years is in itself a tribute to their work and in striking contrast to the neighboring State of Washington, which has no fire rangers. It is not necessary for me to recall to your memory the destructive fires which prevailed there last summer, which did so much damage to vast areas of valuable timber. There was no damage from fires in the British Columbia railway belt last year. Fire notices are now posted all over the Province, and also in the far North. Even away up in the Peace River district these warning notices are displayed. The department has received much valuable assistance from the Hudson's Bay Co., and also from the various railway companies whose sectionmen have posted many notices in remote places."

"Another work which the department has undertaken, is the preservation of timbered areas at the head waters of various rivers, so as to ensure more precipitation in these districts and also to act as a reservoir for the water, thereby preventing sudden floods. We have already reserved a district at the headwaters of the Kamloops River, which will not be thrown open for homestead entry. This scheme has been already adopted with great success in the Northwest Territories on land that is nearly useless for agricultural purposes, to the consequent benefit of other areas some distance away."



THE SAULT PULP MILLS.

The attempt to get the shareholders of the Consolidated Lake Superior Co. to take up the bonds of the company has failed, and the whole works have been closed pending a solution of the difficulty. Speaking of the pulp mills, Cornelius Shields, the new president, said: "The Sault Ste. Marie Pulp and Paper Company has been losing money heavily on its pulp. With logs at several dollars per cord below the price other mills are paying and making money, these mills ought to be making good profits. I have hardly been here long enough to get down to the bottom of this matter, but the profitable operation of these plants seems to be wholly a question of management. The losses on the sulphite mill appear to have been due to the attempt to get gas from the roasting of pyrrhotite, which has not yielded enough gas to enable the mill to make more than 18 or 20 tons of pulp per day on a rated capacity of 50 to 60 tons. The substitution of pyrites, or sulphur when pyrites could not be had, has resulted in increasing the output to about 40 tons per day. The fourth dry machine, which has just been installed, completes the equipment of this mill as planned. The ground wood mill has lost much time on account of shortage of logs, which should have been provided against. The operation of the mill seems to have

been unnecessarily expensive, and the cost of pulp has therefore been too high. Both the ground wood and sulphite mills have been gradually reducing their costs until they are now about equal to the prices obtained for the pulp. Still further reductions must be made, and no doubt can be made. The price of pulp is advancing, and as the output has been sold a long way ahead, there is a chance to turn the past losses into a good profit. It is hard to tell what these mills ought to return, but I should say that both of them ought to show not less than \$75,000 for next year. Either of them ought to make more than that if the costs can be brought down where they should be. About 300 men are employed in getting out the timber and handling the logs until they are laid down at the mill. White spruce alone is used, though there are other species of pulp wood on the company's concession. About ninety tons a day are being turned out, of which far the greatest part is sold in the United States."

The financial crisis of the company not only closes the pulp mills, but the veneer mill, the car shops, the Algoma Iron Works, the steel plant, and the various mines under the control of the Consolidated Company, throwing out of employment in all about 3,500 men. The sulphite mill employed 100 men, and the ground wood mill about the same number. To take a part of the output of the Canadian mills a fifteen-ton paper plant was being installed on the United States side, and this plant was to be extended largely in the spring. At the time of the crisis the new president was bringing the mills down to a paying basis by dropping some of the costly experiments introduced by the late management and by coming back to well-tried methods; but, while profits are now assured, the prospects for an early resumption of steady work at the pulp mills are not bright, as the men have been called in from the woods, leaving the mills without a supply of material when the time comes for resumption. For an export trade in pulp these mills are not so well situated as mills in eastern Canada or

near the Pacific coast and the present policy of looking to their own paper mill, on the United States side and to other paper mills of the north-western States for a market is apparently the wisest. In the interests of the pulp trade it seems a pity that the different branches of the Consolidated Company's works could not be separated, so that those mills which pay by themselves can be operated and not tied up by the unprofitable branches. Better is half a loaf than no bread at all.



SODIUM BI-SULPHATE IN PAPER SIZING.

It is not generally recognized that the sizing of paper is effected by the precipitation of free rosin, and not of aluminum resinate. In accordance with this view, the author formerly advocated the use of sulphuric acid in place of aluminum sulphate for decomposing the rosin soap. Sulphuric acid is, however, a dangerous substance to add to paper pulp, and if no aluminum salt be used, the sizing effect is liable to fail owing to the clotting together of the precipitated rosin. With aluminum salts, the gelatinous precipitate which is simultaneously produced assists the fine division of the rosin. Sodium bi-sulphate possesses the advantages without the disadvantages of sulphuric acid. It is cheaper than an equivalent quantity of sulphuric acid, and one part of the bi-sulphate can do the work of three parts of aluminum sulphate. For papers which have to be sized with a minimum proportion of rosin (2.5 to 3.5 per cent.), the author recommends that one-half of the aluminum sulphate be replaced by an equivalent quantity of sodium bi-sulphate.

But in cases where a larger proportion (5 to 6 per cent.) of rosin is permissible, the whole of the aluminum sulphate may be replaced by sodium bi-sulphate, and since the rosin so precipitated is cheaper than the paper itself, its use as a binding and loading material may be extended. If the presence of traces of iron in the bi-sulphate be objectionable, the iron should be pre-

cipitated by potassium ferrocyanide. In order to avoid corrosion of the beater knives, the bi-sulphate should be added shortly before the beater is discharged, or else it should be added to the pulp in the mixing chest.—Dr. Wurster in *Papier Zeitung*, Socy. Chem. Ind.



—British Consul Dundas in his report on the trade of Norway for 1902 says: "In the pulp business I learnt that the pulp to foreign countries has to be perforated for duty purposes, but goes untouched to the United Kingdom, hence the export thither is preferred because the perforating process entails, naturally, special machinery and more labor. In all the principal places are to be found works of different kinds, which, if they cannot compete in size with works in the United Kingdom, France and Germany, are nevertheless deserving of attention, and testify that Norway is doing more than is commonly supposed, and capable of doing much more under more favorable conditions."



NOT REDUCED TO PULP.

Mr. Chamberlain has not worked out his fiscal reform scheme to such a degree that he can say he has reduced it to pulp.

In the Imperial House of Commons on the 7th ult. Sir John Leng asked the Secretary of State for the Colonies whether he was aware that the value of wood pulp imported into the United Kingdom for paper-makers last year was, in round numbers, £250,000 from Canada, as against £2,000,000 from Norway and Sweden; and, if so, whether he proposes in his fiscal policy a duty on the £2,000,000 worth of Scandinavian wood pulp; and whether wood pulp will be treated as a manufactured or raw material.

Mr. Chamberlain replied: "I am aware that the figures are roughly as stated in the question. In answer to the latter part of the question, I have to say that I have not made any proposal with regard to wood pulp."

Sir John Leng asked whether Mr.

Chamberlain had considered the extent to which the British public are indebted for their cheap newspapers and literature to the use by British printers and publishers of £2,000,000 worth of paper manufactured in European countries and the United States; and whether he proposes to raise the price of that paper by the imposition of an import duty.

Mr. Chamberlain said: "I do not think that the British public owe cheap literature entirely or mainly to the importation of foreign materials, but I have made no proposal to tax them."

Mill Matters

A fire which broke out in the Brown paper bag factory, at St. John, N.B., was discovered by the police in time to be easily extinguished, and prevent any serious damage being done.

G. A. F., in the Paper Trade Review, of London, says that the paper trade seems generally favorable to some kind of tariff reform, though to what extent free trade should be interfered with in the interests of that industry is not apparent. Enquiry can do no harm.

The Canada Atlantic Railway, according to an official, will move this year between 20,000 and 25,000 cords of poplar from points along its main and branch lines. Large stocks of spruce pulp wood are still lying at the stations along the Gatineau branch of the Canadian Pacific Railway, officially known as the Ottawa Northern and Western Railway. This will be shipped to the American mills as the rolling stock becomes available.

The extension of the Ottawa, Northern and Western Railway, or what is commonly known as the Gatineau branch of the Canadian Pacific Railway, which will reach Maniwaki, 30 miles beyond Gracefield, the old terminus, about the end of the year, will be a boon to the pulp industry. The Gatineau is a great country for spruce, and thousands of cords are shipped yearly by rail from Gracefield and other points.

The railway extension will open up new territory, and the output of pulpwood will likely show a large increase next season.

A contractor has made a proposition to the Pulp Wood Company, of Appleton, Wis., to supply a considerable amount of spruce timber from Michigan and the north shore of Lake Superior and from Canada, which he proposed to raft across the great lakes and deliver at Manitowac.—Paper Trade Journal.

The Rainy River Pulp & Paper Co., which received a concession from Ontario at the last session of the Legislature, is making surveys for flumes, dams, mills, etc., and intends erecting a 30-ton mechanical pulp mill and a 15-ton chemical mill. They will also erect a saw mill and do a general lumbering business. They expect to have the saw mill in operation next spring, and the pulp mill by the spring of 1905.

The Sandusky Foundry and Machine Company, of Sandusky, Ohio, have recently arranged with the Waterous Engine Works, Brantford, Ont., for the manufacture of Millspaugh patent shower pipes in Canada. The fact of the Waterous Engine Works entering into a contract for building this apparatus will be recognized in Canada as an endorsement of the same. A number of Canadian mills have introduced these shower pipes, and we are informed that very many of the largest mills in the United States are using the Millspaugh system with profit. Enquiries should be addressed to the Sandusky Foundry and Machine Co., Sandusky, Ohio.

According to the report of the Edinburgh Chamber of Commerce, the paper manufacturing industry in the neighborhood of Edinburgh may be said to be confined to the valleys of the Esk and of the Water of Leith. In the valley of the Esk there are seven paper mills, and in the valley of the Water of Leith, nine. The Esk, with its seven mills, has seventeen machines, with an output of about 25,000 tons per year, and a value of approximately £750,000; in the

Water of Leith mills there are twelve paper making machines, and the approximate output per year 15,000 tons, of the value of £250,000, the sixteen mills aggregating an output of £1,000,000.

Announcement has been made that the Canadian railways will on October 1st advance the rates on pulpwood consigned to United States points. The advance will average half a cent per 100 pounds.

A fire, caused by an explosion of oil in the engine-room, destroyed the roofing paper factory of Alex. McArthur & Co., Logan Street, Montreal, this month. The loss on building and stock was several thousand dollars.

The Chatham, N.B., World reports that John Stuart has visited the town, and is negotiating with the town council for a valuation of the pulp mill property, now lying idle. Mr. Stuart said that if the valuation for assessment purposes could be reduced to \$50,000 he would endeavor to form a company to start up the mill.

Reference has been made to the proposed pulp mills on Princess Royal Island, B.C. A report from Vancouver is to the effect that J. J. Palmer, of Toronto; Col. Mellis, of Aberdeen, Scotland, and John Yule, of London, England, have examined spruce limits on this island covering 80,000 acres. Mr. Palmer stated that they have decided to build pulp and paper mills at a cost of \$1,000,000, the capacity being 100 tons of news and wrapping per day.

The United States trade returns for the month of July show that wood pulp to the amount of 1,835,622 pounds, valued at \$36,285, was exported to all points. Of this total it appears that 150,000 pounds was shipped from Detroit, 150,660 pounds from Memphremagog, 31,325 pounds from Oswegatchie, 17,200 pounds from Puget Sound, and 33,614 pounds from Vermont to various places in Canada, making 382,599 pounds shipped to Canada in the month. It is supposed that this is bonded for re-export to foreign countries.

We understand that the Seattle syndicate, which last July purchased 50,000 acres of British Columbia timber lands from Hon. James Dunsmuir, have no intention of going into the manufacture of pulp, their business being confined to lumbering operations.

At the mouth of the Powell River, B.C., about fifty miles from Vancouver, a pulp mill is to be built by Benton E. Turner, of New York. A power dam is to be built at the mouth of the river. Mr. Turner has secured 250 square miles of timber land in a number of parcels distributed along the shore.

The Court of Appeal for Ontario has ordered a new trial in the case of Glasgow vs. the Toronto Paper Manufacturing Co. The action was brought before Judge Britton to recover damages for the loss of one hand and portions of the fingers of the other while operating a paper cutter in the Paper Company's mill, and resulted in a verdict for \$1,200 for the plaintiff. The company urged contributory negligence and has succeeded in securing a new trial.

A correspondent of the Paper Mill, of New York, on the pulp wood situation in Quebec, says: "An Eastern Townships man, who appears to have special information on the subject, has made the statement that there will be an enormous increase in the quantity of pulp wood cut this season in Quebec for export to the United States. This was not unexpected. American license holders have increased the extent of their limits, either by purchases at Government sales or by negotiations with persons who bought directly from the Government. Moreover, it is well known that of the two camps into which the lumbermen are divided—pro-export and anti-export—the former have the advantage. They have the Provincial Government with them. The Government desires the revenue from stumpage, and has an idea that it would fall off greatly if the American market for Quebec pulp wood were cut off, either by excessive differential stumpage dues, or by a home manufacturing condition in the licenses.

Among the new companies incorporated is the Compagnie Maritime et Commerciale du Bas St. Laurent, with a capital of \$40,000, and head office at Ellis Bay, Island of Anticosti, of which H. A. Meunier is the chief promoter. Among other powers it is given the right to manufacture and trade in pulp and paper.

A limit was recently sold on the Sturgeon River in the Nipissing district, 35 square miles in extent, for \$200,000. Five years ago it could have been purchased for two-thirds that amount. Another limit, which was bought some time ago for \$100,000, was sold soon after for \$125,000, passing the next week to a third party for \$150,000. In two months it again changed hands at \$210,000, and the holders have been offered a substantial advance. Ten years ago it would not have brought more than \$30,000 or \$40,000.

At the annual meeting of the Victoria, B.C., Board of Trade the president thus touched on the pulp and paper industry: "The manufacture of wood pulp has engaged the active attention of this board for some years past, and the Provincial Government offers inducements for the selection of the timber and power necessary for carrying on such an enterprise. A very valuable concession has been secured by a company contemplating operations at Quatsino, and preliminary works are now in progress. This is another industry which requires a large capital, and there is every indication that such an investment on Vancouver Island would give good returns. We have on Vancouver Island timber in valuable merchantable varieties, which in quality and quantity is not excelled in any part of the world. These varieties comprise, chiefly, Douglas fir, cedar, spruce, balsam and hemlock. The forest lands are heavily timbered and the indentations in the coast lines furnish a natural advantage in cheap water transportation of the logs. Risk in such transportation can be minimized in most cases by selecting practically landlocked channels."

Pusey & Jones Company, of Wilmington, Del., have the contract for the new paper machine for the Laurentide Pulp Company, of Grand Mere, Que. It is the fourth machine built for this mill by the Pusey & Jones Co.

The Sturgeon Falls pulp and paper mills are to be in operation next month. They will ship to Great Britain and Australia principally, though some of their products may be marketed on this continent. C. W. Rantoul is general manager.

Flax pulp, the manufacture of which is to be taken up by Flax Pulp, Limited, in England, and the By-Products Paper Co., of New York, as announced in the last issue of the Pulp and Paper Magazine, is said to be well adapted for the manufacture of fine writing and other high class papers, in fact, to compete with the best as to quality, and the poorest as to price. The production of high class papers in England is said to amount to 500 tons a day, and Flax Pulp, Limited, proposes to commence with a turn-out of 5 tons a day. The profit, at £10 a ton, should ensure to the company a net profit of £15,000 on a year of 300 working days, or 15 per cent. on the proposed capital of £100,000, it being decided to reserve 25,000 shares for future issue. The French-Hickman Flax Fibre Company, whose patents have been acquired, are to receive £33,000 in £1 shares of the company issued as fully paid, £27,000 in cash or fully paid shares, and £5,000 in cash, the latter representing only a fair proportion allocated to the English rights of the expenses incurred by the French-Hickman Flax Fibre Company. The directors of Flax Fibre, Limited, are Harold Krall, F. J. Fowles, H. Grandage, W. R. Marchant, and A. F. Newman, the consulting chemists are Cross & Bevan, and the secretary H. P. Philpot. The New York By-Products Co. has a capital of \$2,000,000. The process is the invention of Dr. Hickman, who gave years of patient research to it, and it is said to be most successful, while it also appears to be very profitable.

The Montrose Paper Co.'s new mill at Thorold started up this month, and is now running on high grade writing and book papers.

The Lawton Wark Co. propose to keep their saw and pulp mills near Ste. Agatha running all winter by means of a new device. A pond near the mill will be filled with logs this fall and in the winter the pond is to be kept above the freezing point by steam pipes run into the bottom of the pond, so that the logs can be taken into the mill as in summer.

Charles H. Vogel, paper mill engineer, of Ottawa, recently made surveys and examinations of a large water power and mill site in the Rainy River district in connection with a valuable pulp concession owned by Toronto and Winnipeg parties. Mr. Vogel returned by way of Wisconsin, visiting the mills of the Fox River Valley, where he received his early training in the pulp and paper industry.

It is natural for the Scandinavian papers to make the most of the failure of the Acadia Pulp and Paper Co., and the extract from the *Farmand*, quoted elsewhere, contains some grains of truth, but not the whole truth. The fact of the mismanagement of one concern is no argument against the advantages of the whole country. The mere circumstance that the Acadia people placed themselves in a position where they had to draw on outside limits for their supplies, and that they were competing against themselves to such an extent in buying wood that they were paying \$6 or \$7 a cord where they might have got it for \$3 or \$4 explains enough.

A conference was held a few days ago between Hon. E. J. Davis, Commissioner of Crown Lands of Ontario; W. E. Backus, of Minneapolis, interested in a power company which desires to develop power for transmission to that city from the Canadian side, and representatives of the town of Fort Frances and of Mackenzie, Mann & Co. There was a strong determination by the Fort Frances people that the water powers of the town

should not be used to build up United States cities only, as has been the case at Niagara Falls; and in view of this feeling an agreement was reached whereby the Backus company agrees to develop half its power on the Canadian side, and if it fails to carry out this condition another company may step in and develop power.

The Harmsworths, proprietors of the *Daily Mail* and several other publications in London, Eng., have taken up the option they had on the Newfoundland property of the Timber Estates Co., referred to in a recent issue. The mills and pulp lands secured by the English publishers were situated at Millerstown, on a branch of the Reid railway line, and all the timber limits were tapped by the railway. Negotiations for the purchase were made by J. D. Harmsworth. The timber lands owned by the Harmsworths hitherto have been in Sweden, so that the present decision shows the westward trend of business in the pulp line.

An Ontario charter has been granted to a new company called the Cornwall Paper Manufacturing Co., Limited, the capital of which is \$250,000, and the headquarters at Cornwall, Ont. The promoters are Michael Patrick Davis, of Ottawa, contractor, and Roderick Roderick McLennan, contractor; Stansfield Greenwood, superintendent of the Canadian Colored Cotton Mills Company; Roderick John Pitts, merchant; Ezra Healy Brown, druggist; Joseph Squire, paper manufacturer; Louis Andrew Ross, mill owner, and Peter Curtis Derochie, founder, all of Cornwall. Mr. Squire was formerly superintendent of the Toronto Paper Co.'s mill at Cornwall. It is proposed to locate the mill at the foot of Sheik's Island, near M. P. Davis's power house. The plans are now being drawn. The buildings will be constructed of stone, which will be quarried in the old river bed where part of the St. Lawrence flowed before the building of the Sheik's Island dams. The mill will be fitted for the manufacture of fine book and writing papers.

Walter G. Jones, of Halifax, has been appointed liquidator of the Acadia Pulp and Paper Co., following the visit of W. A. Browne, who came out from London in the interest of the bondholders.

The Metabetchouan Pulp Company has a large number of men at work upon its railway line at Lake Bouchette to connect with the Quebec & Lake St. John Railway.

S. G. Rolland, brother of Hon. J. D. Rolland, of Montreal, will erect a paper mill at St. Adele, Que., on the North river, where over 4,000-h.p. is available. The mill will supply the lower grades of paper for the Rolland Paper Co.

The St. George Pulp and Paper Co.'s new mill, at St. George, N.B., is reported to be running. The present output is 40 tons a day, which is marketed in the Eastern States. Joseph Goodfellow, of Fort Edward, N.Y., is president; E. G. Murphy, of Sandy Hill, N.Y., vice-president, and E. W. Murphy, of New York, secretary-treasurer.

The great strike of paper makers in the paper mills of Holyoke, Mass., after nine weeks' duration, resulted in discomfiture for the men. The men had declined the advance in wages offered by the mills, but in consequence of the strike this offer was withdrawn by the mill owners, and the men at last returned to work unconditionally, leaving it to the mill owners to make advances at discretion. The firemen, who went out in sympathy with the mill men, endangering the mills by their action, have not been taken back.

An association called the Lumbermen's and Limit Holders' Association, of New Brunswick, has been formed, with headquarters at St. John. Henry Hilyard, of St. John, is president, Allan Ritchie, of Newcastle, vice-president, and R. A. Lawlor, of Chatham, secretary. The annual meeting is to be held on the first Tuesday in July. The new association was represented at a conference last month between Surveyor-General Dunn and about a hundred lumbermen. Mr. Dunn invited suggestions as to the way the proposed stumpage dues

should be levied, and he announced that the Government had under consideration the appointment of permanent scalers, making them fire, game and fish wardens.

The explorers sent out by the Ontario Government during the past summer confirm previous reports of the wealth of the great timber region extending through North Ontario to James Bay. One of the party, Harold Jarvis, speaks of the timber in the Lake Abittibi region as follows: "The trees in this region are, White and black spruce, Canada balsam, white cedar, balm of Gilead, paper and yellow birch, jack pine, tamarack, black ash, white and red pine, white elm, mountain ash, pin cherry, mountain maple, several species of dwarf willow, shad bush and alder. Of these the most important from the lumberman's standpoint are white spruce, measuring from 14 to 24 inches in diameter; black spruce, from 14 to 16 inches; balm of Gilead, 18 inches; white cedar, 2 feet; aspen, 14 to 20 inches."



—The World's Paper Trade Review thinks that during the last five years Scandinavian wood pulp mills have suffered in no way from the competition of Canada in the British market. Norway has lost ground to some extent, but Sweden has made great progress. In 1902 the total value of all classes of wood pulp imported into Great Britain amounted to £2,398,215, and supplies received from Norway represented 43.2 per cent., from Sweden 39.3 per cent., and from Canada 10.6 per cent. In 1898 the total value was £1,894,395, Norway's share being 51 per cent.; Sweden's, 29.2 per cent. and Canada's, 9 per cent.



BRITISH CHEMICAL MARKET.

S. W. Roysce & Co. report as follows on the British chemical trade: "The general demand for chemicals is at present certainly slow, mainly, however, from the textile branches, but with the resumption of something like a normal state of affairs in the cotton trade, which it is hoped may soon occur, there would be

fair reasons for expecting a good autumn business, as quite a number of articles are now offered at prices that should prove attractive to consumers when considering about next year's contracts. In heavy alkalies values remain fairly steady, but demand is not active. Bleaching powder is slow of sale, most buyers having contracted for their requirements. Caustic soda is quiet, and prices are rather on the easy side though nominally unchanged. Ammonia alkali is quite firm. Exports of soda compounds and bleaching materials show fairly well in quantity during July; in the seven completed months of this year as compared with corresponding period of 1902, there is in the former an increase of 10,578 tons, or £4,986, and in the latter an increase of 4,416 tons, but a decrease of £43,819. Imports of brimstone show well during last month, but this year, up to July 31st, there is a decrease of 1,210 tons, or £7,701, as compared with the first seven months of 1902. Prices are ruling steady, and the trade in Sicily is reported to be in good condition. The china clay trade is looking well: shipments are active, and enquiries are now coming to hand for next year's delivery."

Other reports give the following quotations:

Alkali (58 per cent.), firm at £4 10s. to £4 15s. f.o.b., at works; bleaching powder, £3 5s. to £3 10s. in casks on the rail; soda crystals 60s. per ton; hyposulphite of soda, £4 15s.

In the British pulp market chemical pulp is firm, but sales are not large; and in mechanical also there is little doing, but there is more frequent enquiry and prices have a slight upward tendency.

Reports from Christiania to 1st Sept. state that the Scandinavian pulp mills are still running on short time, but without any material effect on prices, while stocks are still accumulating. Some English buyers have purchased at 67 to 70 shillings, and present sales of mechanical are made at a loss to the producers.

TIMBER LIMIT SALES.

The next sales of the Ontario timber limits, advertised to be held in Toronto December 9th, will be the largest in the province since 1885. About 900 square miles will be put up. This will mean the timber rights in twenty-five townships. Only the pine will be sold, the spruce and other woods to remain the property of the Crown. The sale is intended to encourage settlers on farm lands; and sales are to be in parcels of a tenth of a township, a smaller division than has been made before. A new condition also imposed is that the timber must be cleared off in ten years. The sales are to be offset against the construction of the Temiscaming & Northern Railway, some of the limits being in the region of that enterprise. It is anticipated that the hardwood, spruce and other timbers will pass into the hands of settlers, as they take up and cultivate the land. Some berths are offered in the Rainy River District, and are tributary to the Canadian Northern Railway. In addition to the change of conditions noted above, ground rents are to be increased to \$5 a square mile, against \$2 in former sales, and the dues payable to the Crown on cutting the timber are advanced to \$2 per thousand feet b.m., and on square timber \$50 per thousand cubic feet, or double the old rate.



GERMAN PAPER MAKERS' ASSOCIATION.

At the annual meeting of the German Paper Makers' Association a proposal to abolish export duties on rags and wood pulp was commended, and was supported by the chemical pulp makers. The president proposed the appointment of a commission to look into the question of establishing technical schools of paper making. Professor Herzberg mentioned that commencing from January 1st next all the tests of normal papers carried on at the technical laboratory at Berlin would be made by the Schopper apparatus. During 1902 the average selling price of paper had dropped from

12s. to 11s. 4d. per cwt., but since the commencement of the present year a slight recovery had taken place, the prices of printing papers having advanced by about 3d. per cwt. The next annual meeting of the association is to be held at Hamburg.



PERSONAL.

James Alexander, trades chemist, of Pittsburg, Penn., is making a business tour in Canada.

Harry B. Wood and son, connected with the pulp trade of Manchester, recently returned to England after a visit to the pulp mills of Canada and the United States.

Joseph Dixon, a director of the paper mills of Charles Marsden & Sons, of Tamworth, Barnsley, and Wakefield, England, has been visiting Canada as the delegate from the Sheffield Chamber of Commerce at the Congress of Chambers of Commerce at Montreal.

Geo. H. Waring has retired from the position of mechanical superintendent of the Cushing Sulphite Fibre Co., St. John, N.B., being succeeded by his son, Geo. H. Waring, Jr. Mr. Waring, Sen., has taken an interest in the Allan foundry at St. John, which has been incorporated under the name of the Union Foundry and Machine Works.

Edward Finley, late managing director of the Kinleith Paper Mills, is now on a visit, with Mrs. Finley, to Scotland, and expects to return to Canada in about six weeks. Mr. Finley is succeeded by Ambrose Ayerst, formerly of the Jessup & Moore Co., of Wilmington, Del. Mr. Ayerst was a former Ontario boy, and was for several years with the Royal Paper Mills, of East Angus, Que.

W. A. Browne, secretary of the Indian and General Trust Co., of London, Eng., has been visiting Nova Scotia to report upon the condition of the Acadia Pulp and Paper Co.'s mills, referred to at length in our July number. Mr. Browne's company gave financial backing to the Acadia mills. After leaving

Nova Scotia Mr. Browne paid a visit to the Sturgeon Falls mills and other pulp and paper centres of Canada.



—The British Papermakers' Association and the British Wood Pulp Association are endeavoring to form a Joint Court of Arbitration for the settlement of small disputes. F. Becker and J. G. Henderson represent the latter association in the negotiations.



—Maine is the chief source of the future supply of good spruce in the United States for paper making. Of the State's total area of 31,500 square miles, 21,000 square miles are in forest land, and from a recent rough survey it is estimated by the State authorities that there are now standing about 21,239,000,000 feet of spruce. It is thought that the annual growth is sufficient to permit the cutting of 637,000,000 feet of spruce without depleting the supply.



—The quantity of paper exported from Norway is about 52,720 tons (of which Great Britain takes 40,471 tons) of all descriptions, of the estimated value of £544,077. The principal centres of the export of this article are Skien, Drammen, Christiania, Christiansand, Sarpsborg, Brevik, Porsgrund and Trondhjem; and the largest customers next to the United Kingdom, but to a much less extent, are Germany and Holland.



—The establishment of the new line of steamers between Canada and France direct should turn the attention of Canadian pulp manufacturers to the opportunities of trade with French paper mills. Like Great Britain, France is not to any great extent a manufacturer of pulp, and her supplies of wood pulp are now chiefly derived from Norway and Sweden. A number of enquiries have lately been received in Montreal from France regarding Canadian pulp, and if low freights are furnished by the new Franco-Canadian line this trade should rapidly grow.

UNITED STATES IMPORTS OF PAPER MATERIALS.

The following figures show the imports into the United States of paper stock and wood pulp for the past three years ending June:

PAPER STOCK. IMPORTS.

	1901.		1902.		1903.	
	Quantities.	Value	Quantities.	Value.	Quantities.	Value.
Rags, other than woolen (lbs.)....	55,669,311	\$874,444	73,314,499	\$1,252,205	103,853,329	\$1,640,927
All other.....		1,309,242		1,518,050		1,374,157
Totals		\$2,183,686		\$2,770,255		\$3,315,084

This stock was imported from the countries named below:

	1901.	1902.	1903.
United Kingdom.....	\$939,985	\$1,092,903	\$1,113,089
Belgium	233,447	316,145	349,327
France	178,273	250,824	268,208
Germany	453,006	721,060	866,909
Italy	48,896	58,183	100,629
Other Europe.....	95,340	181,871	92,132
British North America.....	116,112	113,662	98,828
East Indies.....	1,263	465	5,950
Japan	89,564	10,352	....
Other countries.....	27,800	24,790	120,012
Totals	\$2,183,686	\$2,770,255	\$3,015,084

WOOD PULP. IMPORTS.

	1901.		1902.		1903.	
	Tons.	Values.	Tons.	Values.	Tons.	Values.
Germany	2,823	\$158,355	5,533	\$238,461	13,783	611,449
Other Europe.....	7,089	363,393	10,621	498,113	21,113	909,298
British N. America.	36,845	1,064,654	51,262	1,322,518	81,985	1,867,023
Other countries.....						
Totals	46,757	\$1,586,402	67,416	\$2,059,092	116,881	\$3,387,770

—In their new pulp mill at Fraserville, Quebec, the River du Loup Pulp Co., Limited, have installed an improved system of machinery, the improvement being in the method used for sheeting the pulp for shipment. Every person familiar with pulp mill machinery is conversant with the faults of the ordinary wet machine used for sheeting pulp, the excessive cost for felts, rolls, repairs, etc., and the comparatively small capacity of each machine, compared with the floor space it occupies. In the "Hughes process," as used by the River du Loup Pulp Co., the wet machine is entirely

dispensed with, and its place, together with the place of the expensive hydraulic presses, is taken by the "Hughes" hydraulic pulp machine, which, with a capacity equal to a 72-inch wet machine, only occupies a floor space of six feet wide by nine feet long, and besides, dispenses entirely with felts, rolls, gears, belts, and all the other clumsy and complicated machinery now in use. The press room of the River du Loup Pulp Co., with a daily capacity of 40 tons dry weight per 24 hours, is only 50 feet by 50 feet, and not only that, but sufficient space is left so that additional machines

can be added, bringing the capacity up to 55 or 60 tons dry weight. The process is this: From the screens the pulp passes over a simple form of "slush" machine, which extracts the greater part of the water, and leaves the pulp of about the consistency of porridge. In this form it is pumped directly into the hydraulic pulp machines, which consist of a "compression chamber" divided into four spaces by drainer plates covered with wire cloth, attached to which is a hydraulic cylinder on which any desired pressure can be exerted. Pulp is admitted to this compression chamber, and pressure applied, which extracts the water through the drainer plates, and delivers the finished product in the form of sheets, 20 in. by 26 in. and about $\frac{3}{4}$ in. thick, a very convenient form for baling. Almost any test desired can be obtained, the dryness of the pulp depending entirely on the length of time that the pulp is left in the compression chamber, together with the amount of pressure applied. In this process the fibres of the pulp are not formed into a sheet, as on the ordinary wet machine, and consequently are not matted or interlaced, but simply compressed and the water extracted, leaving the pulp porous and spongy, and consequently much easier to reduce to pulp again in the beating engines of a paper mill. At least 10 per cent. of power can be saved, and in most paper mills power is an important item. Besides the saving in floor space in construction of the mill, and the saving in felt cost, the installation is also much less costly than the ordinary equipment of a pulp mill, in that the heavy hydraulic presses, which are necessary for extracting the water under the old system of sheeting pulp, are entirely dispensed with. From these hydraulic pulp machines the sheets simply pass through a light baling press to be made into bundles for shipment, or, if for local consumption, the sheets can be shipped without bundling, thus dispensing with the baling press as well. The work being all done by hydraulic pressure, no expensive equipment of counter-shafting, belts, etc.,

is necessary, and, everything considered, a noticeable cost of production per dry ton is obtained.—Canada Lumberman.



—"Silvalin" is the name given to a yarn made from paper pulp, etc. It is manufactured according to a process invented by Rudolf Kron, Jr., of Golzern, Saxony. A company has been formed to control the patents taken out in the various countries. In Spain a factory producing "Silvalin" was started up in 1902, and shortly another will begin operations in Saxony. It is reported that all raw materials which can be used in the production of paper can be converted into "Silvalin" with the necessary toughness and appearance of a textile product.



—It is absolutely necessary for the timber requirements of the United Kingdom—leaving other markets out of consideration—that the conservation of the vast forests of Canada should be regarded as a matter of prime Imperial importance. The Canadian Forestry Association, whose existence dates from the year 1900, appears to do all that private and unofficial effort can do to promote forest conservation throughout the Dominion. This, however, has not yet been supplemented by the Government taking direct and active measures for the preservation and management of the vast areas of virgin woodland still existing in Canada. Very properly Mr. Nisbet urges that the Colonial Office should bring pressure to bear upon the Government of Canada with a view to its following the example of the Government of India in instituting a Forest Department, whose object-in-chief would be the conservation and organized management of the timber resources of Canada. Upon these resources, as far at least as they apply to pulp wood, judging from present appearances, the future prosperity of the British paper trade in a large measure depends.—World's Paper Trade Review.

MANCHESTER SCHOOL OF TECHNOLOGY— THE PAPER MAKING SECTION.

Everything internally has been arranged on the most modern principles: the building is ventilated upon the "Plenum" system, and the heating is so procured as to prevent any undue condensation of steam in working the plant; it is lighted throughout with electricity, generated in the electric light station of the main building; the steam required for heating and for use with the plant is also supplied from the main building, whilst a special gas-fired boiler is installed for securing a supply of pure steam for operators requiring it. The various sections of machines are all driven by separate electric motors with a considerable speed range, so that the different trials can be made under very varying conditions as to speed, etc. It is interesting to note that nearly all the dyeing and printing machinery has been specially designed and constructed, and, in many instances, various types of machines have been combined so as to save space and expense. Enough has been said to prove our statement that the hard work in planning and equipping the building has been prodigious. The Corporation has twice sent Professor Hubner to travel the Continent in order that, in the selection of the entire machinery and appliances, the Manchester School might have, in every instance, the best that was known at home and abroad; and it is fortunate that they were able to entrust the selection to a gentleman so widely known in Continental industrial circles, and one possessing, to so large an extent, the "Open sesame!" to their dye-houses.

Let us examine the building which Manchester has provided as the stepping-stone from theory to practice, and the coupling of the Technical School to the workshop. With respect to paper-making, the appliances are such as are used for all classes of hand and machine-made papers, and are readily adaptable to the technical treatment of the various kinds of raw materials used in paper-making and for experiment therewith. The course in paper manufacture will be

arranged so as to give opportunity of practical trials in respect of boiling, breaking, bleaching, beating, sizing, and coloring, and the stuff thus prepared will be converted into paper by hand and on the model Fourdrinier paper-making machine. This will be followed by a thoroughly practical course in testing, including the valuation of the raw material or paper and the finished product. The methods and conditions which influence the production of the various qualities of paper can thus be carefully studied in all its stages on papers actually made in the school. The comparative trials made in the laboratory on the sizing, loading, and tinting, etc., of papers can afterwards be carried on on a larger scale on the special plant provided, which has been so designed as to permit at comparatively small cost of original investigations and experimental operations which should prove of considerable interest and value to the industry.

We have practically, in this new building, the modern paper-making plant in miniature. The tank for dissolving the caustic for fibre-boiling purposes is first noticeable, and the boiling is done in a spherical steam-revolving kier—4 atms. equal 60 lb. pressure. The boiled rags are carried into the washer and breaker—porcelain-lined—in which the roll and beating-plate are fitted with bronze knives. Sometimes the patent basalt lava stone roll, recently introduced from Germany by J. Marx & Co., is used, its advantages being in the matter of despatch and beating. After being washed and broken, the rags are translated to the draining-chest—a wooden drainer fitted with a perforated brass drainer-plate. The "half-stuff" is either taken back to the Hollander and mixed with wood pulp, etc., or can be finally beaten in the Hollander with the bronze knife roll, or with the basalt lava stone roll. Hemmer's patent underflow beater then receives the half-stuff from the drainer, the beater having a roll also fitted with bronze knives and a couple of screw propellers for quick travelling. The beaten pulp, or stuff, is then laid

into the stuff chest, whence it is despatched by compressed air, or through copper pipes, to the stuff chest, which is fitted with a horizontal revolving agitator and lift buckets for regulating the flow to the machine. It next passes over the sand tables and on to a bellows strainer. After it has passed the strainer, it runs on to the Fourdrinier machine or may be taken to the hand-making vat. This actually describes the mode of manipulating the plant here.

The construction of the Fourdrinier machine is well known to our readers, but it may be of interest to refer to its chief characteristics. The wet end is composed mostly of brass to prevent corrosion, and the machine, as it appears in miniature in the new building, has an adjustable shake motion, with two vacuum boxes, and all the appliances of the full-sized machine, the vacuum boxes being connected to a 3-throw brass vacuum pump. Two granite rolls are operated in place of cast-iron rolls for first and second press rolls, the supposed advantage of this being that a better sheet will be produced, and one devoid of rust. The first stack of drying cylinders consists of five, then come a pair of intermediate or smoothing rolls and a stack or battery of three cylinders, following which are the slitting and reeling arrangements. It may be stated, *en passant*, that the Fourdrinier machine is driven by a 12 h.-p. electric motor, while the shake, strainer, vacuum pumps, and agitator are driven by a separate motor. From the reeler, the paper goes to a stack of four-bowl calenders, which can either be used for rolling or friction glazing, and there are a re-reeling and ripping machine and a sheet-cutting machine for finishing the paper either in rolls or sheets; the paper is cut and sorted and taken into the department used for finished paper and cloth. Reverting to the hand-making paper plant, we may mention that it consists of a regulator and vat with agitator. From the vat the pulp is formed on to a hand mould, pressed on to coucher felts—a pile of these are placed under the screw press, and, after receiving several pres-

sings, the sheets are sized, then dried on a special copper-coated steam-heated cylinder and put through a plate-glazing calender.

The paper-testing laboratories are equipped with microscopes and all the appliances required for microscopic work. The room is fitted with the customary chemical benches, and among the special testing instruments are those for determining the absorption properties of blotting-paper, various classes of automatic micrometers, special balances for the estimation of ash and loadings, and paper scales. There are two of Louis Schaffer's machines for testing the tensile strength of paper, these machines being worked with a small hydraulic piston. There are also Hartig-Reusch-Leuner tearing machines, Wendler tearing machines—driven by a small electric motor—a special tearing machine for single fibres and fibre bundles, a folding and crushing machine, a wood pulp drying stone, and a testing apparatus for the ink and water resisting qualities of paper and for filter. At one end of the laboratory—the room is also used for the lectures—has been fixed a micro and marco-projection, by which fibres, or book illustrations, may either be photographed or thrown on to the lantern screen for purposes of demonstration, and there is also a powerful electrical plant equal to 30,000 candle-power installed with the object of testing for fastness to light, under conditions approximating to daylight, coloring matter used in dyeing. A dyeing apparatus is fitted up by which the comparative dyeing powers of colors on paper pulp may be examined, and there are benches on which are stationed small microscopes for analyzing and discovering the fibres of paper. In making these varied tests, it is essential that the room should be charged with the proper amount of moisture, and this can be regulated by a humidifier which has been fixed in the centre of the room. In a special dark room for the developing of micro-photographs are a series of cupboards, each of which is furnished with a different type of artificial light. This is to enable a

comparison to be made of shades in the various lights, and is of the greatest importance in dyeing and also in paper-making, on account of many of the colors changing considerably in artificial light. We may add that, in connection with the paper-making and bleaching, two electrolizers are provided for making bleach liquors from brine. This is the latest process.

The theoretical and practical instruction, for which Mr. Hubner is responsible in the new department, is complementary to the courses in mathematics, mechanics, physics, and chemistry, carried on in the main building, in which there is also provided an intermediate course in tinctorial chemistry leading up to the more practical courses. The courses in general chemistry are under the immediate direction of Professor W. J. Pope, who is the head of the department of pure and applied chemistry, whilst the lectures in tinctorial chemistry and the laboratory processes of dyeing are in the hands of Dr. E. Knecht. In the new building assistants will be employed who have a thorough practical knowledge of the various industries represented in the building.—Paper Maker.



THE OUTLOOK IN THE ADIRONDACKS.

The Association for the Protection of the Adirondacks has issued a sketch of the origin and practical uses of the Adirondack Park which contains reasons for the continuance of the State's policy of acquiring land for forest preservation. Facts are given concerning the acreage of public and private lands, and the rate at which the forests are being removed for lumber and paper pulp.

The sketch refers to Governor Odell's refusal to follow the policy of his five predecessors as to the Adirondacks, and holds him responsible for the non-fulfilment of the pledge in the last Republican platform to resume the purchase of lands within the limits of the Adirondack and Catskill Parks. It goes on to say: "The manufacture of wood pulp is in-

initely more destructive to the forests than lumbering. The object of the lumberman is to get large trees, and trees below a certain size are unprofitable for his purposes. The lumberman, therefore, formerly took nothing smaller than trees twelve inches in diameter at the stump. As the object of the wood pulp manufacturer is to reduce his product to an impalpable consistency, he is not restricted to any size, but uses every stick on which he can lay his hands. His operations, therefore, destroy the small spruce, hemlock, and balsam to such an extent as to leave no hope for a future crop of this valuable product without artificial planting. Furthermore, the products of the acid factories poison the streams, killing the fishes therein and threatening human life.

"The rate at which the Adirondack forests are being cut down and the ratio of pulp wood to lumber product will appear from the following figures showing the output of the Adirondack forests in 1901, the figures expressing board feet:

Spruce (pulp mills).....	237,483,126
Spruce (saw mills)....	154,430,030
Hemlock	63,809,318
White pine	46,043,091
Hardwood (saw mills).....	36,452,529
Hardwoods (cooperage, chemicals, etc.)	6,036,804
Total	544,254,898

"The lamentable situation which confronts the State at the present time with regard to the Adirondacks is this: The forests are rapidly disappearing. The disastrous consequences which will follow their disappearance are perfectly well known. The State for fifteen years prior to Governor Odell's inauguration developed a policy looking to the avoidance of those results. The State has the money with which to continue to provide for its future safety in this respect. The land—to the extent of hundreds of thousands of acres—is available at reasonable prices for this purpose. The highest considerations of public wisdom dictate its acquisition. The people of the State have expressed their approval of such a

course. And yet, in the face of all these considerations, the Governor of the State, for reasons which, so far as he has divined them, are utterly inadequate and unsatisfactory, has interdicted any further steps in this direction.



CONCERNING ESPARTO.

Although the paper manufacturers of England use enormous quantities of wood pulp, their imports of esparto are increasing. In its July circular concerning the trade an English firm that is considered an authority on the subject says: "During the past four weeks the market has shown a little more animation, and a fair extent of business has been put through in African for early, medium, and late shipments. There has been little change in price, although any movement has again been towards a fractional decline from former quotations, but sellers are now opposing any further concession, and the tone is perhaps somewhat steadier than it has been for the past month or two. The imports during June were small, and in marked contrast with those of the previous month, and the total for the half year compares unfavorably with that of 1902. The twelve months' figures, however, are maintained at a fair level, and are nearly 15,000 tons above those of the similar period terminating in June last year. For early loading steamers are obtainable at moderate rates of freight, but the advent of the fruit and grain season is expected to raise the cost of esparto transport for all shipments after next month, and this is not without its influence on sellers when offering further supplies.

"Spanish receipts last month were small, and the total for the half year, 24,570 tons, has therefore fallen away from that of 1902 by 2,500 tons. There has been little movement in the market for this description; the enquiry has been confined within narrow compass.

"Algerian also has been in short supply during June, and the six months' figures stand at 30,659 tons, compared with

34,112 last year. Sellers have shown more disposition to take contracts for the new crop with shipments down to next spring or early summer, a moderate number of transactions has been concluded at about 1s. 3d. reduction from former quotations. At the lower level prices are firm, and any further modification is resisted for the present. Advices from Oran confirm the view expressed last month that the military operations in the South are not likely to affect the esparto supply in any measure.

"Tunisian last month was a heavy arrival, and the half year's receipts have reached the important total of 23,377 tons, against 15,809 last year and 21,680 in 1901. There has been some demand for distant shipments, which has been fairly responded to by some sellers. Others are not so ready to take engagements at the quotations now current, owing to possible restrictions to trade in the local markets through the reported granting of "concessions" to French subjects only of the sole right of purchase from native collectors in certain districts.

"Tripoli imports were nothing last month, and the half year's record, therefore, remains at 15,274 tons, and has to be compared with 23,162 tons in 1902. Enquiry has been slow, and only a limited business carried through at about previous figures, and generally with the option to sellers to substitute Sfax. The stocks at the shipping ports are meagre, and as labor is greatly absorbed by the bountiful barley harvest, there is very little esparto coming to market."



PEAT MOSS FOR PAPER MAKING.

W. M. Callender, of 25 Victoria Street, Westminster, London, Eng., has obtained an English patent on a process of making paper from peat moss. The inventor takes a given quantity of peat moss and saturates it in a volume of water equal to about ten times its own weight, more or less, and then, when thoroughly mixed, adds a small quantity of bromine, diluted with water so as to

be easily handled. The bromine so added attacks the gummy substances surrounding the fibres, and renders them more soluble in an alkaline solution. He agitates the whole mass thoroughly, and then adds a small quantity of alkali, preferably soda ash, and subjects the whole to heat with or without pressure. The heat is continued, or boiling and pressure, for about five hours, and then he finds that most of the gummy substances have been dissolved, and are either clinging to the fibre or are in solution. He finds that, in practice, he gets good results by using eight pounds of bromine to the ton of peat, and about 100 pounds of soda to the same quantity of peat, viz., one ton. He claims the saturation of peat moss, or other fibres, with water; the admixture thereto of bromine, or its equivalent; the addition thereto of an alkali, caustic or otherwise; the boiling or heating of the mass under pressure or in open vessels; and the washing and draining of the product so as to free it from its gummy surroundings.



DURABILITY OF PAPERS.

Some kinds of paper are normally only exposed to natural physico-chemical influences such as are brought about by changes of temperature, atmospheric moisture, light, and any noxious gases which may be present in the air. In the latter case the effects are particularly noticeable where the paper is kept in places which are inhabited, for the atmosphere of inhabited rooms, and especially those where gas is burnt, always contains small quantities of ammonia, nitric and nitrous acids, also sulphurous and sulphuric acids, which are readily absorbed by the porous paper, and still more so if it has any opportunity to absorb moisture as well. Every expert knows that some papers improve by keeping; but there are chemical changes which are always productive of harm, and it is a matter of the highest consequence to obtain a knowledge of their nature, so as to be able to ensure fixed grades of durability. In addition to external changes there are also

changes in what is known as "size durability," changes which may sometimes amount to total loss, and in which true chemical reactions go on. Furthermore, it is a well-known fact that paper often becomes brittle. Such heavy loss in mechanical strength must be due to profound changes, not only in the structure of the paper itself, but in the very substance of the fibres. Looking at the question, what it is that really does change, it becomes obvious at once that many changes take place in the secondary constituents of the paper, not in the fibres composing it. A case in point is the gilding of wood-free papers, and the changes of color, consisting in the fading of the original tints, also the deterioration in the keeping power of the size, all of which changes properly belong to this class. Such changes may naturally interfere seriously with the uses for which a paper is required, or may only render it unsightly without affecting its strength and other properties. More dangerous are those deeper changes which attack the substance of the fibres, but which do not attack only papers containing wood pulp. Papers of medium quality consisting of cellulose fibre, and even pure rag papers, have been found to undergo internal changes, independently of abnormal external influences, which have rendered them sufficiently brittle to break when folded across. Cases of this kind have been known to occur even where the manufacturers have taken every conceivable care to use only the best grades of rag fibre. In all cases, both kinds of changes, viz., those which merely concern the secondary constituents and those which attack the main constituents, i.e., the fibres, must be kept distinct from each other.—Dr. Klemm, in *Wochenblatt für Papierfabrikation*.



BACILLUS OF PAPER SIZE.

"It frequently happens during the operation of sizing that the size turns and work is a failure. What is the cause of this and could you give me a remedy?"

The above communication was recent-

ly received, together with some samples of paper, from a leading paper mill of Annonay (France), by Mr. E. Pozzi-Escot, director of the chemical department of the Malzeville Laboratories.

"With resinate of alumina or starch," says Mr. Pozzi-Escot, "I do not know whether microbes are injurious or not, but this is what happens when gelatine size is utilized for paper. Paper sized in this way has sometimes a sickening, repulsive odor, which is caused by the action of a microbe. This I ascertained as follows:

"I subjected the samples of paper treated with turned size, received from the Annonay mill mentioned, to microbic analysis and also chemical. I found the gelatine was peptonized. It was the case of a microbe digesting and peptonizing gelatine, thus making it unfit for sizing. The evil being discovered, it was not a difficult task to find a remedy.

"In the first place, the manufacturer should sterilize the gelatine solutions by employment of antiseptics.

"On the other hand, the paper must be protected as far as possible against causes of infection.

"Or, again, the paper might be kept in warehouses artificially ventilated with antiseptic air by ozone or any other system.

"Finally, the drying cylinders should contain very pure air, if possible, free from noxious germs.

"I think that employment of ozone as an antiseptic is self indicated. However, it is for the manufacturer to decide. He knows the cause of the mischief, and will merely be embarrassed in making a selection of the remedy."—World's Paper Trade Review.



BLEACHING SOLUTIONS.

In a paper before the Liverpool Section of the Society of Chemical Industry Messrs. Arthur Carey and Max Muspratt commend the following to users of bleaching powder solutions:

"To summarize our results, we consider that in order to make and settle a bleaching powder solution in the shortest time, and with an almost complete utilization of the chlorine contents, the following precautions should be observed:

"Water used in the Solutions.—The water should not be cold. The best practical temperature is 75 to 80 degrees F.

"Bleaching Powder.—This should be emptied into the agitating tank through a one-inch mesh sieve, any lumps being knocked through with the flat of a spade.

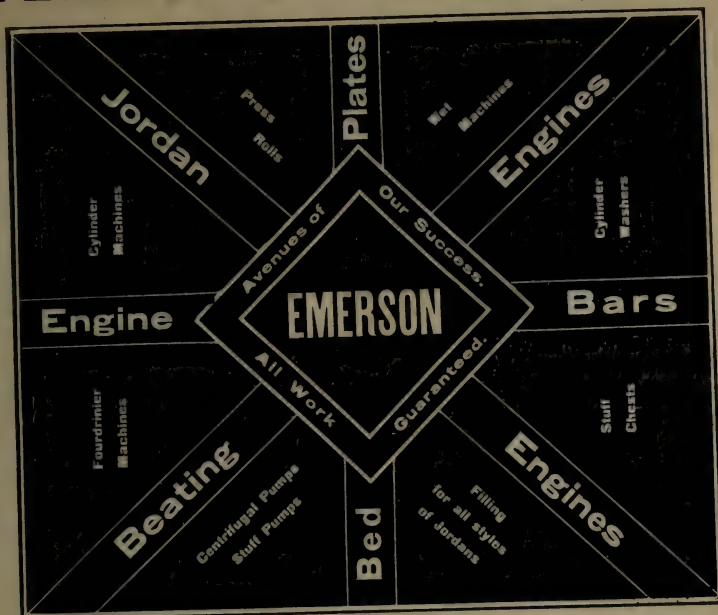
"Agitation.—The agitation should be performed so as to show a strong swirl on the surface—say, with a periphery speed on the agitators of 500 feet per minute for tanks of five-foot to nine-foot diameter, and the lower limbs of the agitator should be not more than one-inch from the bottom of the tank. After completing the volume of the batch thoroughly, agitation for twenty minutes is ample for all strengths of solution up to 16 degrees Tw. Further time speed on agitation is wasted, and by beating up the bleaching powder renders subsequent settling appreciably slower.

"Clearing Space for Sludge.—The run-off pipe should be at such a height as to allow five cubic feet of sludge per cwt. of bleaching powder used per batch for all strengths of solution up to 16 degrees Tw. Unless a sufficient space is allowed, enormous waste of time will arise in waiting for the last few inches to settle clear.

"Washing Sludge.—The sludge consists not of bleaching powder, but of insoluble lime suspended in bleach solution. When the clear liquor has been run off, the agitating tank should be filled again with water, and the contents agitated for five minutes only prior to settling.

"Efficiency of Plant.—When the above advice is followed, the loss of bleaching powder in the washed sludge will not exceed two pounds per cwt. of bleaching powder used, provided the last clear liquor is not more than 2 degrees Tw.

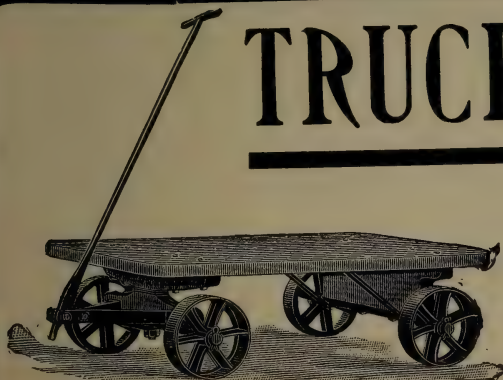
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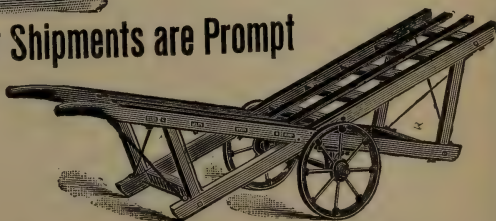


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THE MARKETS.

There are no changes to note in the rag and paper stock market, prices being steady in Montreal.

In the pulp market chemical fibre is stronger, and prices are stiffening. Quotations are from \$1.85 to \$2 per cwt., delivered, according to quality. Ground wood pulp is quoted at \$13.50 to \$14.50, f.o.b. at pulp mill. The closing of the mills at Sault Ste. Marie is expected to have a hardening effect on prices in Canada.

One thing that will keep up prices of pulp in Canada and the United States without increasing the profits of the mill owners is the increased cost of getting out wood. Woodmen and laborers have been attracted to Western Canada and to the big industrial enterprises of our eastern cities to such an extent in the last two years that it is almost impossible to get good, skilled men. For example, good axemen are now asking \$30 to \$35 a month, against \$26 to \$30 last year, and against \$16 to \$18 five or six years ago; while the cost of provid-

ing for the men while in the woods has increased in the last two years about 30 per cent. It is not to be wondered at, therefore, that our neighbors across the line, at Watertown, for instance, are now having to pay \$10.50 a cord for peeled spruce, delivered, which they got last year at \$2 to \$3 less. The mills of Wisconsin, while not able to get Canadian wood from Crown lands, under the prohibition law, still derive about half of their supplies from privately owned lands in Ontario, and this costs them about \$8 a cord in the rough, or about \$10 peeled.



In giving a list of fires which have occurred in paper, pulp and straw board mills, the New York Journal of Commerce says: "It will be noted that several important losses have occurred in wood pulp mills, indicating that there is a serious hazard outside of the rag hazard, which has been looked on as the great hazard in paper mills. With a reported loss of about three million dollars in three years it is evident that this is a non-paying class."

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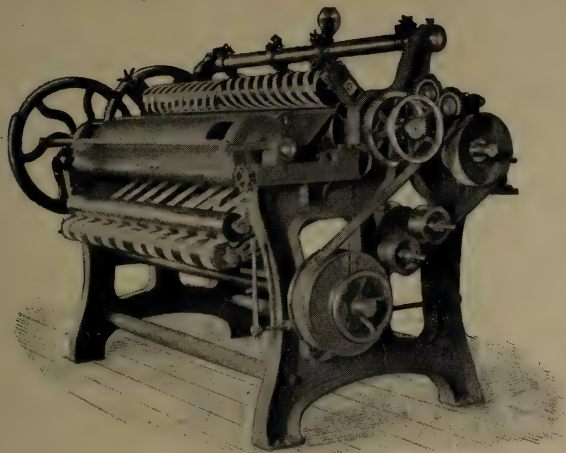
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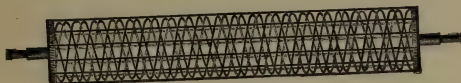
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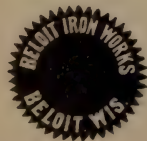
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THROUGH SCANDINAVIAN CLASSES.

The following article from one of the Scandinavian papers, the *Farmand*, on the recent difficulties of the Acadia Pulp and Paper Co., discloses the sentiments and opinions of the Scandinavian trade towards Canada as their growing rival in the pulp business:

"The Acadia Company, as it appears from Lockwood's Directory, has three mills, viz., Rapid Falls, with a capacity of some 29 tons; Cowie Falls, 11 tons; and Morgan Falls, 18 tons; all dry weight per day, together 58 tons. This makes, with 300 working days, about 17,500 tons dry weight or 35,000 moist weight per annum. Even calculating full capacity, which, according to the above statement, has not been reached, the company, during 1902, lost on every ton they made or sold more than one dollar, and as prices ruled far higher last year than at present, it may be taken for granted that their average

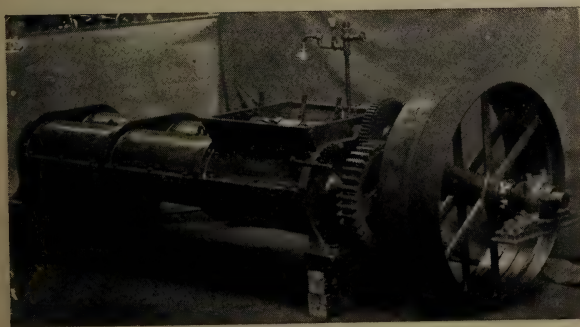
selling price for the whole year was at least 5s. to 7s. 6d. more than the present market value, or in other words something like 42s. 6d. to 45s., c.i.f. English ports.

"These particulars are undoubtedly very interesting from a Scandinavian point of view.

"Being situated in Nova Scotia, with a comparatively speaking low sea freight, cheap timber, short railway carriage, etc., the Acadia Company should be one of the best fitted in Canada for exporting to Europe, and in spite of all these advantages they lose more than one dollar per ton when selling at not below 42s. 6d. c.i.f. English ports. That most Scandinavian mills could produce the pulp without loss, and even make a small profit at this price, every one concerned in the trade will undoubtedly be aware of, and this shows once more how far better situated the Scandinavians are in spite of all talk about cheap timber, etc., in Canada. That mills worse situated

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than the Acadia Company will have even a higher cost of production goes without saying, and under these circumstances it would not be surprising if some of the mills in Canada who have made those long 3—5 years' contracts with papermakers in Great Britain at about 40s. c.i.f. English ports might find out ere long that it will be difficult to deliver on these contracts without heavy losses. There is reason to believe that the Acadia Company also have made such long contracts with British papermakers, and it remains to be seen whether those buyers will get what they bought. It may also be remembered in connection with the company's intention of running their mills until September that the navigation on the St. Lawrence River stops in November, and that accordingly far into next year no very large quantity of Canadian pulp will appear in the European markets.

"As a whole the Acadia Company case goes far to prove that Canadian mills are unable to make their pulp at such

absurdly low prices as are being talked about, and it is only fair to say that British, and Continental papermakers would act wisely in directing their attention more to Scandinavia, where in the long run they will find their best and cheapest suppliers of pulp wood."

Upon invitation of the general manager F. J. Campbell, Charles M. Hays, vice-president of the Grand Trunk Railway, and party, paid a visit to the Canada Paper Company's new mill at Windsor Mills. Mr. Hays expressed himself as highly pleased with the machinery. He is reported to have said it was a pity that steps were not taken to stop the export of raw material so that all the pulpwood in Canada would be made into paper here. He said that he believed the local manufacture of the wood into paper would be beneficial to both the people and the railways.

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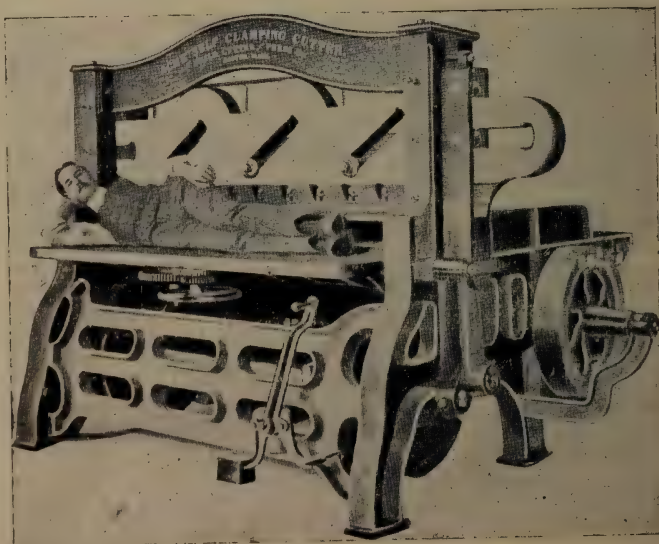
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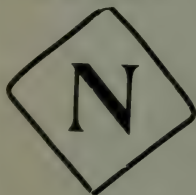
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PULP AND PAPER MAGAZINE

MONTREAL AND TORONTO

Vol. 1.

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No. 6.

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Pulp Catching Machine.
Storage of Wood Pulp.
Testing Animal Size.
Loss on Chloride of Lime.
Drought, Flood and Forestry.
The Victory Screen.
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Jordan Engine.
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- Paper cutting-machine knives.
- Chopping and barking machine knives.
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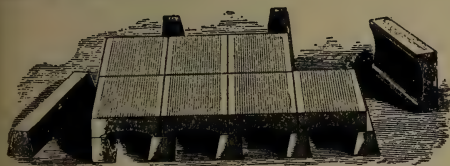
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SAMUEL SNELL, Holyoke, Mass.

There is a probability that the new plant of the Caritte-Patterson Manufacturing Co., Limited, will be established in St. John for the manufacture of tar paper. Permission has been asked from the Halifax city council to erect the plant in that city, but the matter has met with some opposition, and the com-

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pany has stated that unless the desired permission were given the industry would locate in St. John.—Sun.

The case of the Cushing Sulphite Fibre Co., Limited, vs. Geo. S. Cushing has been in progress in the equity court at St. John during the past month. The evidence is all in, but judgment has not yet been rendered.

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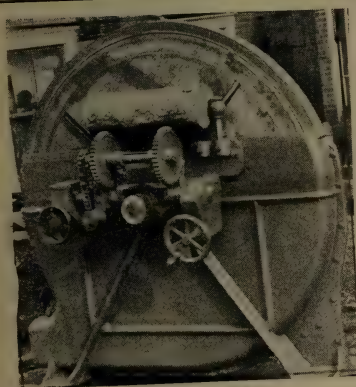
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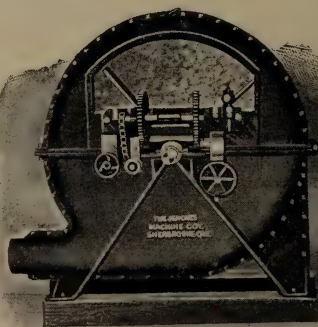
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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 6.

TORONTO, OCTOBER, 1903.

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Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 5th and 10th of each month.

SUBSCRIPTIONS: Canada, Great Britain and the United States, \$1 a year; to Foreign Countries, 5s. a year.

Changes of advertisements should be in the publishers' hands not later than the 1st of the month, and, where proofs are required, four days earlier. Cuts should be sent to the Toronto office, by mail, not by express.

BIGGAR-SAMUEL, LIMITED,

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18 Court St., TORONTO.

Fraser Bldg., MONTREAL.

SOUTH AFRICAN PREFERENTIAL TARIFF.

It will be interesting to Canadian manufacturers of all classes to know that the new preferential tariff of the South African colonies, which was planned at a customs conference in Bloemfontein last March, is now in actual operation. Under this tariff goods from Great Britain will enter Cape Colony, Natal, the Transvaal and Orange River Colony at a reduction of 25 per cent. from the rate under the general tariff. It is provided that a like preference will be granted to any British colonies granting reciprocal concessions. It is provided in the Canadian Preferential Tariff Act of 1897 that the preference will be given to "any British colony or possession the

customs tariff of which is on the whole as favorable to Canada as the British preferential tariff [of Canada] herein referred to is to such colony or possession," so that, so far as Canada is concerned, we understand that the reciprocal preference between Canada and South Africa goes into operation automatically. This should open up a good prospect for trade in papers of Canadian make. As will be seen by the figures published last month, Great Britain has the premier place in the paper imports of South Africa, but there is no reason why, under the stimulus of this new preference, Canadian papers should not displace those of other countries now occupying secondary positions in the list of paper imports. Indeed, seeing that in the case of Australia the United States has within the past five years made rapid advances in that market, while Great Britain and other countries have receded, relatively, there is really no reason why Canada should not share in some lines, the trade the Mother Country is doing in South Africa. There are at present neither paper nor pulp mills in the South African colonies, and as such an industry, even if started, is not likely to assume any dimensions for many years, the market for Canadian

papers, once opened up, would be the more likely to develop.

To give an idea of the possibilities for Canadian manufacturers in general in this part of the Empire, we need only mention what our wideawake neighbors have done in recent years in South Africa. The exports of the United States to those colonies, though they have grown steadily in the last twenty-five years, did not amount to a tenth of British exports there down to the year 1897, but they expanded to one-quarter of the British exports last year, or, in round figures, \$33,000,000. When the Canadian preferential act of 1897 was promulgated, it already embraced in the scope of its operations the colonies of Bermuda, the British West Indies and British Guiana; so that if other colonies, especially Australasia, reciprocated in the matter of tariffs, the British Empire would of itself afford a wide field for papers "made in Canada."



NON-SHRINKABLE PAPER.

Tests for making paper "mellow" and non-shrinkable have recently been made at the Treasury Department, at Washington. The process is designed for paper to be used in map drawing and for printing paper money. Official maps have hitherto had to be drawn and copied by hand on hand-made linen paper, as all other papers would shrink and thus become of no value for scientific purposes, because of being untrue to scale. In this process, which is the joint invention of E. H. Fowler, chief draughtsman of the coast survey, and D. N. Hoover, chief printer, the paper is treated by a chemical solution, which is said to be inexpensive, and which when applied to paper changes its character

in more ways than one. We are told that by the application of the chemical mixture to a Japanese napkin, that article becomes as soft and pliable as a tissue of silk. The chemical preparation acts as an antiseptic and a preservative. When applied to old documents, it seems to knit the fibre together and prevents further decay. It is stated that in printing bills on paper which has been treated by the new process, no wetting is necessary. The ink loses none of its lustre when applied to the paper, as under the old process, and is thoroughly dry within forty-eight hours after the printing is done. Not only is the appearance of the bill much handsomer than under the old method but its wearing qualities are believed to be greater. New bills on such paper would not have the crisp feel of those printed on present paper, but it is thought that a method of subsequent treatment would starch the bills if needed. It is reported that Julius Bien & Co., a New York printing firm, is highly gratified at the results of tests made of this paper on which fifteen colors were printed. There was no shrinkage, and the registration was perfect. There are some details yet to be worked out, but while the success of many an invention has been wrecked on the snag of a "detail," we are told that these details will not prevent the application of the process to any class of paper, nor will its expense add much to the cost of the finished product. If these expectations should be realized, there will be a wide field for this discovery. It is said that the Japanese Government, besides several large manufacturers of paper in the United States, have made overtures for the invention, but the United States Government will have the first advantages of it.

ANGLO-CANADIAN PAPER TRADE.

We have already given figures from Canadian sources, relating to trade in pulp and paper between Canada and Great Britain. The following figures, on the same subject, are taken from the British Board of Trade returns, the values being in sterling money:

Imports of Unprinted Papers from Canada to Great Britain.

Quantities,

	Cwts.	Values.
1898	6,275	£ 3,448
1899	90,853	47,643
1900	181,867	100,803
1901	184,298	96,029
1902	157,193	82,656

Imports from Canada to Great Britain, of Strawboards or Millboards.

Quantities,

	Cwts.	Values.
1898	3,324	£ 629
1899	31,365	12,438
1900	3,440	1,568
1901	1,256	529
1902	2,945	1,394

Imports from Canada to Great Britain, Wood Pulp Boards.

Quantities,

	Cwts.	Values.
1898	22,103	£ 9,792
1899	46,244	21,772
1900	73,990	34,212
1901	38,984	19,439
1902	56,801	23,578

Imports from Canada to Great Britain, Wood Pulp.

Quantities,

	Tons.	Values.
1898	46,685	£ 171,388
1899	38,422	130,948
1900	54,507	246,435
1901	70,110	312,356
1902	83,771	254,370

Beginning with 1901, the imports into Great Britain in wood pulp have been classified into chemical, wet and dry, and mechanical, wet and dry. In 1901

the import from Canada in chemical pulp, dry, was 18,707 tons, and in 1902, 9,124 tons. In chemical pulp, wet, the import was 774 tons and in 1902, none. In mechanical pulp, dry, the import was 2,078 tons, in 1901, and 2,012, in 1902, and in mechanical, wet, 48,551 tons, in 1901, and 72,635 in 1902. To give an idea of the relative trade of Canada and other countries in pulp, it may be stated that in 1902 Great Britain imported 102,174 tons of chemical, dry, from Sweden, 57,413 from Norway, 3,870 from Germany, 5,309 from Holland, 2,878 from the United States, and 4,675 from other foreign countries. In chemical, wet, the import was 4,587 from Sweden, 8,358 from Norway, and 216 from other countries.

In mechanical, dry, the import was 3,957 tons from Sweden, 2,394 from Norway, 55 from Germany, 1,727 from the United States, and 958 from other foreign countries; while in mechanical, wet, it was 32,014 from Sweden, 211,196 from Norway, and 247 from British possessions, other than Canada, but none from foreign countries besides those named. Without going into detailed statistics, it may be said that while the Scandinavian trade with Great Britain has grown during the five-year period referred to, Canadian trade with Great Britain has grown in a greater ratio. This is satisfactory, as far as it goes, but from the figures given it will be seen that Canadian pulp manufacturers will have to pass several milestones before they lead Sweden and Norway in this trade, though our aggregate exports of pulp are already ahead of the United States without any preference in the British market to turn the scale in our favor.

What the possibilities of Canadian paper trade with Great Britain would be

with a British duty as substantially in favor of Canada, as Canada's duty now is in favor of Britain, may be gathered from the trade returns, from which it appears that British imports from the United States in 1902 of unprinted papers were 315,773 cwts. valued at £248,898. Of printed and coated papers, the imports from the United States were 23,542 cwts., valued at £58,900; of strawboard or millboard, 87,115 cwts., valued at £42,151; of wood pulp boards, 122,284 cwts., valued at £59,206. Of course there are classes of paper which are not now made in any large quantity in Canada, and no matter what the preference, Canada could not at once fill "the vacant chair," but making due allowance for this, it will be seen that a preference in the British market would open up to Canada a large volume of trade in paper and paper materials now supplied by the United States. By such a preference Canada would gain at the expense of other countries than the United States, as the grand totals of British imports of papers, etc., are very large. In 1902 she imported from all foreign countries unprinted papers to the amount of 3,556,151 cwts., valued at £2,956,765; of printed and coated papers, 171,379 cwts., valued at £543,160; of strawboard or millboard, 2,016,716, valued at £694,248; of wood pulp boards, 56,801, valued at £23,578; of wood pulp, 441,781 tons, valued at £2,143,351; besides the imports of rags, grass and other paper making materials. Converting these values into dollars, we have an opening in the paper line in Great Britain, which would bring about an enormous stimulus to Canadian trade under a preferential tariff; and which offers a grand prize for the skillful manufacturer even under the present free trade conditions.

—The Scandinavian mechanical wood pulp manufacturers hope to improve their position in the British market by establishing a general sales office in London, where all the mills of Norway and Sweden would sell their output. Attempts of this kind have been made before, but have proved failures because of the varying and sometimes conflicting interests of individual mill owners; and while the present depression in the Scandinavian pulp trade may force them together for the time, the combination is hardly likely to last beyond the period of depression. The movement will be watched with interest from the Canadian side, though under present circumstances it is not likely to find imitators here. In fact, Canadian pulp manufacturers would be distinctly better off in competition with such a combine than as they are.



—Referring to the opening of the Manchester Technological College and the need of a system of technical education in Canada the Canadian Journal of Fabrics makes a plea for the textile interests which also applies with equal urgency to the pulp and paper trades. It says: In the cotton and other branches the French-Canadian population are especially deft in mill work, and only require technical training to achieve the highest results. Had a system of technical training been adopted in Quebec years ago, the French-Canadians, who now provide the bulk of the skilled labor for United States mills, would have been employed at home in cotton mills that would have been shipping Canadian cottons all over the world. As it is, Canadian labor has all these years been building up United States industries and aggrandizing United States capital. The cheap water-power possessed by this

country will, no doubt, in time draw back much of this capital and skilled labor; but a technical training school will help on the process, and it is time that our Provincial Governments bestirred themselves to do their part if they want to save Canada from dropping out of the race." A man is wanted who will do for the paper trades what Sir William Macdonald has done for the engineering trades in equipping the Applied Science Department of McGill. As the pulp and paper industry has a great future in Canada, a start might be made, as in Manchester, by combining the textile with the pulp and paper trades in equipping the first institution.



—Up to this year a Canadian paper, whose subscription price to places in Canada and the United States was \$1 a year, had to charge \$1.25 to \$1.50, according to the weight of a copy, when it was sent to Great Britain and the colonies. The Canadian Government has taken a step of imperial importance by getting the consent of Great Britain and several of the British colonies to receive Canadian papers at the domestic rate of this country. Every month or two since this change was made, some new colony joins the list of those agreeing to this imperial newspaper postage rate, and at present the portions of the Empire included in this new arrangement are: Great Britain, New Zealand, the Transvaal, Newfoundland, Zanzibar, Sarawak, Hong Kong, Gambia, Ceylon, Cyprus, Falkland Islands, British Honduras, Bermuda, Barbadoes, and the Bahama Islands. To all these places the Pulp and Paper Magazine is sent at \$1 a year, while to other foreign countries and colonies the subscription is \$1.25 a year. The peculiarity of the

situation is that, with the exception of Newfoundland, these portions of the Empire do not reciprocate—that is, the papers published there do not have the same cheap rate of postage to Canada, owing to the fact that in most cases such a rate would be lower than the rate paid by these papers in their own country of origin. But this drawback to a great imperial system of cheap postage will not long continue, and we hope the day is not far off when enterprising papers, occupying special fields, will circulate not only in the colony of their origin, but throughout the whole Empire, and thus the editor with a great mission can in a real measure speak to the whole world. It is needless to add that when the whole Empire is united in a system of cheap newspaper exchange, a great development will take place in paper and pulp manufacturing to supply material for the great newspaper issues of the future.



CORNSTALK PAPER.

Since the note in last issue on paper from cornstalks, we have received from the National Fibre and Cellulose Co., of Chicago, a few samples of the paper, and it is evident from these that cornstalks will make paper admirably suited for special purposes. The cost of manufacture on a commercial scale is now the only thing to be demonstrated.

In reply to an enquiry as to what the company had done in the way of manufacturing, we have received the following letter:

"We are in receipt of yours of Sept. 29th, and replying thereto, beg to advise that we are not yet making pulp and paper from cornstalks, and shall probably not have a mill ourselves for, at least, a year yet, although we are gathering the cornstalks now, which we expect to have made into paper at other

mills under our license. We will have from five to ten thousand tons of cornstalks for paper-making purposes this fall.

Our plant for manufacturing the machines is located at Kankakee, Illinois, and at that point we anticipate erecting our first paper mill.

Very truly yours,

National Fibre and Cellulose Co.,

J. S. Cline, Sec.

135 Adams St., Chicago.



AFFORESTATION IN THE ADIRONDACK REGION.

Mr. Campbell, secretary of the Canadian Forestry Association, has returned from a visit to the Adirondack region, whither he went to see the afforestation work carried on by the New York State Commission. Mr. Campbell says: "At Clear Lake Junction and in the vicinity of Saranac Lake two separate areas of burnt-over lands have been replanted with white and Scotch pine, Norway spruce, Douglas fir and European larch. The white and Scotch pine, Mr. Campbell observed, were making the best progress, and are looking healthy and vigorous. The spruce is also making excellent progress. The other trees are growing more slowly, but are making satisfactory progress. Mr. Campbell thinks that it will only be a few years until the whole thousand acres which have been planted will develop into a healthy forest in place of the waste district which has been destroyed by repeated fires. A feature of the tree planting has been that the work has been done at the small cost of half a cent per tree. The commission feel so encouraged by the result of what has already been accomplished that they have laid out a nursery at Saranac Lake, where millions of young trees have been germinated for the purpose of carrying on a continuous system of afforestation.

The lands on which these experiments are being carried on so successfully are very similar to the burned lands in the Provinces of Ontario and Quebec, and

consequently the results will be watched with interest by those interested in afforestation in Canada.



A NEW POLICY FOR FOREST PRESERVATION.

The Commissioner of Crown Lands for Ontario announces a new policy for the preservation and continuance of the forest wealth of the province, as a result of his observations during a recent visit to the Temiskaming district. The policy practically amounts to a system of permanent forest reserves, on which the timber will be sold only as it comes to maturity, and the price paid will be regulated by the amount actually taken, that is to say, measuring will be by the thousand feet, and not by the acreage. To use his own words, the Commissioner explains his views thus: "The position is this: The area in the province that has timber upon it is divided into two classes. One class is land that is good for agricultural purposes. On that class the present system of selling the timber is practically about the only system that can be pursued, because the timber must be cleared off and the land opened up for settlement. The other class of land is not suitable for agriculture, being rocky and otherwise unsuitable. On these areas the new policy will apply. The Temagami reserve was set apart in 1901 as a permanent forest reserve. Since that time we have not sold any timber there. It contains about 1,400,000 acres, or 2,200 square miles of land, not good for agriculture. The proposition is that we should sell certain portions of the timber, as it develops, and can be placed on the market to advantage. We have decided to sell the timber by public competition, at so much a thousand feet, and the trees that are to be taken will be marked by our men. No trees below the size marked can be cut. We are hoping to set apart reserves whenever we can, in other areas, in a similar way. Many old licenses will in time lapse, and the limits will revert to the Crown. These will be reforested and kept as a perma-

ment forest reserve. The system practically is a first step towards the plan of reforestry in use in Germany, and will involve much more stringent regulations in regard to fire ranging than have been hitherto in force."



THE SAULT STE. MARIE INDUSTRIES.

Since the shutting down of the Consolidated Lake Superior Co.'s industries at Sault Ste. Marie numerous writs and injunctions have been issued against the company, and their affairs appear to be in such a tangle that some time is likely to elapse before the various works are again set in operation. At the present moment Speyer & Co. appear to have the upper hand, having agreed to the postponement of the mortgage sale on condition that a receiver be appointed. An effort is being made to get British capitalists in. The employees have all been paid their wages, an arrangement having been made with the banks to furnish the money for that purpose. The pulp wood cut during the past season and still in the woods is to be brought out, thus giving employment to a number of the men and preventing it becoming waste, which it would speedily do if allowed to remain where it now lies. Senator Dandurand is acting in the interest of certain prospective English purchasers. The purchase price is \$30,000,000, of which \$8,000,000 would be paid in cash.



STUMPAGE IN NEW BRUNSWICK.

As briefly reported last month, the N. B. Lumbermen's and Limit Holders' Association after its formation had a conference with Hon. A. T. Dunn, Surveyor-General of New Brunswick, who in his communication announcing the proposed increase of stumpage, said: "You will, I think, agree with me that the policy of issuing long leases, which was adopted ten years ago, has resulted in material benefit to the lumbermen, while by reason of the greater inducement thereby given to the lessees

to preserve and protect the forests, our timber lands are steadily increasing in value. In the larger areas of crown timber lands it is noticeable that during the last ten years fires have not proved so disastrous as formerly. The improved state of the lumber market has, of course, materially benefited those engaged in the industry, and all will admit that it is in a much more prosperous condition than when the reduction of stumpage was made some years ago. Private land owners are reaping the benefit of this improvement by charging higher rates, and the Government would be recreant to its duty if it did not proceed, though to a lesser extent, along the same lines. In connection with this subject we have necessarily been called upon to consider whether we shall continue to exact a uniform rate of stumpage in respect of all crown lands, or whether there should be a difference in the rate, dependent upon the locality, the accessibility of the lumber, the facilities for shipment at all seasons, the nearness to markets, etc."

Frank C. Parker, of the New York State Forestry Association, was introduced to the conference and explained the methods adopted in New York for forest preservation. The association planted a quantity of seed each year, and after a year or two's growth the trees are taken up and transplanted. The association had, a short time ago, set out five hundred thousand trees in one tract, and all of them had shown good results.

From the tenor of the discussion on the subject of stumpage it appeared that the limit holders did not object to the principle of an increase so long as it was a moderate one. The present stumpage is \$1 per thousand superficial feet, which the Government propose to increase to \$1.50. All of the leases in New Brunswick expire at the end of twenty-five years, counting from 1893.

The following is a comparative statement, prepared by the New Brunswick lumbermen, of the scales and stumpages paid in New Brunswick, Ontario and Quebec under present regulations:

	Superficial Feet per Log.			Pieces per 1000 S. Feet.			Stumpages per Log.		
	New Brunswick.	Quebec.	Ontario.	New Brunswick.	Quebec.	Ontario.	New Brunswick, \$1 per M.	Quebec. 65c. per M.	Ontario, \$1.30 per M.
16 Feet Log.									
8 in.	40	32	16	25.	21.25	62.5	.04c	.02c	.02c
9 in.	48	45	25	20.85	22.22	40.	.048c	.029c	.032c
10 in.	64	59	36	15.62	17.	27.77	.067c	.038c	.046c
11 in.	80	67	49	12.5	14.93	20.4	.08c	.043c	.063c
12 in.	96	80	64	10.41	12.5	15.62	.096c	.052c	.083c
13 in.	112	100	81	8.93	10.	12.34	.112c	.065c	.105c
14 in.	130	120	100	7.69	8.33	10.	.113c	.078c	.113c

	Contents 100 Logs.			Stumpages 100 Logs.		
	New Brunswick Scale.	Quebec Scale.	Ontario Scale.	New Brunswick, \$1 per M.	Quebec, 65c. per M.	Ontario, \$1.30 per M.
100 Logs 16 Feet.						
8 in.	4000 s. ft.	3200 s. ft.	1600 s. ft.	\$ 4 00	\$2 08	\$ 2 08
9 in.	4800 s. ft.	4500 s. ft.	2500 s. ft.	4 80	2 92	3 25
10 in.	6400 s. ft.	5900 s. ft.	3600 s. ft.	6 40	3 83	4 68
11 in.	8000 s. ft.	6700 s. ft.	4900 s. ft.	8 00	4 35	6 37
12 in.	9600 s. ft.	8000 s. ft.	6400 s. ft.	9 60	5 20	8 32
13 in.	11200 s. ft.	10000 s. ft.	8100 s. ft.	11 20	6 50	10 53
14 in.	13000 s. ft.	12000 s. ft.	10000 s. ft.	13 00	7 80	13 00

The Atkinson limits of Beauce and Chaudiere, comprising about 224 miles of timber limits, mills, etc., have been purchased by H. R. Goodday & Co., of Quebec.



W. McInnes, of the Geological Survey, has returned from a successful exploration of the Winisk River from the sources to the Hudson Bay shore. The southern part of the country he explored is covered with good spruce, but further north the large trees are confined to the river bank, where the drainage is good. In travelling to the bay the party passed the northern limit of the best timber, and reached the region of black spruce, tamarack and rough bark poplar.

H. L. Frank, founder of the town of Frank, Alberta, now celebrated for the rock slide which occurred last spring, has made a trip up the Jacques Cartier river, in the Province of Quebec. In the opinion of Mr. Frank the district is one of the finest in the world for pulp wood. Mr. Frank said that the people with whom he is associated own 17,000 acres, wooded with black spruce, and in addition they have leased 187 square miles from the Dominion Government. He says it is their intention to build a pulp plant at the mouth of the Jacques Cartier river, where they own 70 acres of land. Here they will avail themselves of a splendid water power, and it is believed that other companies will also install plants in the vicinity.

IMPROVED BLOTTING PAPER.

By a recent English patent it is claimed that an improved kind of blotting paper is produced, in which the absorbent qualities of the paper are assisted by the action of chemicals, from which elements injurious to paper making machinery have been eliminated, upon the wet ink on which it is used, whereby less expensive materials may be employed for the pulp, while greater efficiency is attained. The essential feature consists in impregnating the pulp during the process of manufacture with salts of sodium in combination with a solution of a proto salt or a persalt of iron or of mixtures of the same, or of water impregnated with oxide of iron resulting from the decomposition of salts of iron. The inventor has found that good results are to be obtained when the paper thus manufactured shall contain about four to six per cent. in weight of the combined chemicals, and for the purpose he prefers to use the perchloride of iron and the bicarbonate of sodium, dissolving in the manufacture of five hundred pounds weight of paper about two to three gallons of a solution of perchloride of iron containing about forty per cent. of the same with about four to six pounds of the bicarbonate of sodium in the water used in the manufacture of the said quantity of paper. Other combinations of salts of iron and salts of sodium can be used, but the above-named is the most efficient combination.



PULP CATCHING MACHINE.

Otto Goy has taken out a British patent for an invention that has for its object the more effective recovery of pulp filling material than the ordinary pulp catching plant.

He adds to the material in the pulping engine or in the pulp vat only as much of the earths as the finished paper is to contain, and that portion of earths and pulp which has been withdrawn with the water running from the wet part he con-

tinually conducts back again directly to the pulp after the latter has left the pulp vat and while it passes over the paper machine, so that the quantity of earths contained in the pulp passing over the wet part will be gradually increased until the paper on leaving the presses contains the quantity originally added in the pulping engine or in the pulp vat. For this purpose the water which runs from the sieve portion, suction apparatus, couch and presses, and which is rich in earths, is conducted on to a filter adapted to rotate in a collecting trough and through which the superfluous quantity of water is filtered and runs off in a clear state, while the earths and fibrous materials deposited upon the filter are washed off in the rotation of the filter and drop into a collecting trough, whence they are conducted, together with the diluting water taken from the collector, directly to the pulp as it passes over the paper machine. In order to obtain from the commencement a paper containing the proper quantity of earths it is expedient to mix, either in the collecting trough or in the cycle of the water used, with this water the slight quantity of earths which would otherwise collect of itself during the first part of the work. In lieu of the rotary filler use may also be made of other suitable filtering apparatus. By this method of operation the patentee claims the following advantages:

1. Whereas by the old process two to three times as much of earths is added to the pulp in the vat or in the pulping engine as the finished paper contains, only a slight quantity of earth circulates, such quantity corresponding to the amount of ashes to be contained in the paper.

2. The quantity of pulp and earths which may be lost in the changing of the pulp or of the color, and also in the cleaning, is therefore very slight.

3. The apparatus designed for conveying back the entire solid ingredients, owing to the arrangement, in the cycle, of the filter which separates the superfluous water in a clear condition, is considerably smaller, simpler and cheaper

than in the case of the sedimentation processes.

4. The filter effects a rapid and perfect separation of pulp and earths and clear water, which latter may be used for various purposes.

5. The pulp engines are supplied only with fresh pulp; their quantitative and qualitative efficiency will thus be greater.



STORAGE OF WOOD PULP.

Now that the question of the preservation of wood pulp has been pretty well threshed out, a few words on the various methods of storing it may not be out of place. Every method of preservation has its advantages and disadvantages, and consequently also its adherents and opponents, and one method of storage may, owing to local circumstances, suit one mill better than others. The two methods of storage, however, which are best suited for medium-sized and small mills are either wet storage in pits or drying the pulp. The great advantage of wet storage in pits is that the pulp is always, so to speak, fresh and of good color, and the fibres always remain supple, a point of no small value in working it up. Mr. Braun, of Rochsburg, has, since 1888, obtained splendid results from storage in pits, pulp which has been so stored for upwards of five years appearing as fresh as if it had only been ground the day before. In pit storage, however, it is almost impossible to prevent impurities such as sand, etc., from getting into the pulp, as well as loss of material; moreover, a medium-sized mill will require quite a considerable number of pits. Mills which run a pulp-making plant in addition to the paper-making machinery, and which turn out more pulp at a time than they can consume, will find pit storage the best method of keeping their superfluous material, as it can always be worked up in the hollander direct. Where, on the contrary, special stress is not laid upon having the fibres absolutely fresh, it is more advantageous to dry the pulp. Many pulp makers believe that drying

pulp requires expensive apparatus, and prefer to store the bales of pulp piled up in stacks. In order, however, to keep the stuff from spoiling, sheds or other light structures must be provided which will allow of sufficient circulation of air, but at the same time keep out light and dust. Light structures of this kind will be quite sufficient to keep pulp air-dry, the only thing else required being some means of suspending the pulp in sheet form. A press is not absolutely necessary; pulp containing 33-35 per cent. of dry material can be kept hung up quite easily; nevertheless the usual wooden rails and pasteboard clips should be used for suspending the wet pulp, as they give a better grip of the soft, wet sheets and are not so likely to tear them. The wooden rails between which the wet sheets of pulp are held give a good grip along the whole upper edge of the sheets (which are of considerable weight owing to the large amount of water they contain), and facilitate the handling and suspension of the sheets generally. The uneven contraction of the sheets produced by this method of suspension is of no consequence in this case. The sheets of pulp thus air-dried may be subsequently piled up in large stacks, and if stored in places from which light and moisture can be excluded will keep for years without losing their quality. Sheets of pulp thus dried dissolve more easily than sheets which have been squeezed dry in a hydraulic or screw press, a circumstance which is frequently of advantage. Dried pulp should preferably be put through the edge runner first before going to the hollander, this being the safest way to avoid spotting. On the other hand, where a pulp maker desires to use the dried pulp direct when water is scarce, so as to cover loss in production and to enable the stuff to be delivered wet, the best course is to soften the sheets beforehand in suitable vessels so that they can be readily folded together. They are then doubled up or broken up sufficiently small to go through the beater engine boxes and ground up by the grind-

stones. The dried pulp may be fed to presses working fresh pulp, and if the dried material be added gradually the resultant product cannot be distinguished from fresh stuff. The dried pulp may also when sufficiently soft be fed into the refiner; this, however, makes rather more work than the first method. Mills which use clean well water in place of clarified river water, may also keep their pulp in a wet state by rolling it up in thick rolls. A mill in the Rhenish provinces has kept pulp in this way for over two years without the least signs of deterioration; the rolls were just piled up, and not too well ventilated either. A point worthy of notice, in conclusion, is that pulp should be ground and washed with as much water as possible, so as to thoroughly remove vegetable albumen.—*Holzstoff Zeitung*.



TESTING ANIMAL SIZE.

The most varied proposals have been made for the estimation of the value of a sample of size without any one method having attained universal recognition. During the course of last year the Leipziger Papier-Prüfungsanstalt applied various methods practically to a large number of samples of size, and has decided to publish the experience so gained and those methods of testing which appear most reliable. We should be glad if this investigation would prompt others to communicate their experiences in this direction, so that by publishing the total results a uniform plan of determining the value of animal size might perhaps be elaborated. There are, as is well known, two kinds of animal size; one obtained from the skins, tissues, or muscle fibres of animals, and an inferior kind called gristle size and made from bone, gristle, or cartilage. The first variety contains principally the substance glutin, which is soluble in hot water, and solidifies to a jelly on cooling. The second variety contains the adhesive substance chondrin, similar to, but yet differing from glutin, and in-

ferior also to it in adhesive power. The size obtained from the best materials possesses, in addition to high adhesive power, other properties not common to gristle size. Its external appearance is firstly characteristic and distinctive. It has a brilliant lustre, is nearly transparent, golden yellow to brown in color, and when dissolved in a small quantity of warm water yields a thick, clear liquid which rapidly solidifies when cooled. Inferior qualities of size are wanting in lustre, which is frequently produced artificially by means of lead or zinc salts (which are injurious), are almost opaque, of a dark, muddy color, lack adhesive power, and when dissolved have an unpleasant, sour, sometimes putrid smell. Inferior qualities of size cannot always be detected by external appearances. Substances employed to improve their appearance or add to their weight can only be identified by careful testing. Good dry size should, according to Heinzerling, contain only 5 per cent. to 6 per cent. of water, which statement is corroborated also by Dr. Post. Anybody who has had frequent occasion to test size for its water percentage will find, however, that size as a rule contains from 14 per cent. to 18 per cent. of water. A method recommended by Dr. Kiessling is to rasp from two to three grains off the sheets of size with a wood rasp, and dry the raspings in a weighing bottle in an air bath at a temperature of from 110 to 115 degrees C., till the weight is constant. This method is eminently satisfactory as thicker pieces cannot be completely dried. The ash may be determined from the portion used for the determination of the water. The material is incinerated in a covered platinum crucible at the full heat of the Bunsen burner. The combustible particles of bone are decomposed by repeated cooling, moistening with water, and again heating the contents of the crucible to redness. The ash of leather size contains a good deal of quicklime, which prevents it from fusing like the ash of gristle size when subjected to the heat of the Bunsen

burner. The ash of gristle size contains phosphoric acid and chlorine compounds, whereas leather size is free from these salts, and has a strongly alkaline reaction. All mineral substances—either such as have got into the size during manufacture, or have been purposely added for special purposes, such as lead or zinc salts to improve its appearance—are detected in the ash. Free acid, which is present in gristle size especially, is detected in the size solution by Congo paper, and estimated quantitatively by titration. Fat, which is sometimes found in size, may be injurious; size containing fat being inadmissible for use in paper-making. The fat may be removed by extracting a rasped and dried sample with benzine or other similar solvent of fat; the solvent is then evaporated, and the residual fat weighed in a tared dish. It is generally considered, although hardly rightly, that it is a good sign of the adhesive power of a size if it absorbs a large quantity of water. Good brands of size should be able to take up more than five times their weight of water. The method employed is to allow an air-dry weighed piece of two to three grains in weight to soak for twenty-four hours in cold water at room temperature, i.e., 15 to 20 degrees C. The superfluous water is then removed, the sample carefully dried with blotting paper and weighed. It has been found that good brands of size gelatinize even when largely diluted—in other words, the solution sets to a jelly when cold—and that the jelly has a greater viscosity than inferior kinds of less adhesive power. One part of air-dry size is soaked in water, warmed on a water bath till dissolved, and then diluted with water until the solution contains one part of size to nine parts of water. The method Lippowitz employs is to allow the size jelly to stand in a cylindrical vessel for twelve hours, and then test it for viscosity by means of a metal rod with a rounded end. The rod, which is held in a guide, is placed vertically over the jelly, and weighted at its upper end till it has penetrated a definite distance into the size. Whether the adhesive

power of the size, which is of course its most important property, can be reliably estimated by this test is doubtful. A more reliable test of the adhesive power, calculated on the resistance which hardened size offers to mechanical forces, may be carried out as follows: 5 grains of air-dry size are softened in 50 c.c. of water, and dissolved at a temperature not exceeding 80 degrees on a water bath. The wide faces of two beechwood or oak blocks 3 centimetres wide, 1.5 centimetres thick, and 4 centimetres long are then cemented together by means of the size so prepared, the surface covered by the size being 9 square centimetres. The blocks are then kept for three days in a dry atmosphere under a pressure of two kilogrammes. The force necessary to separate the two blocks furnishes a numerical value for the adhesive power, and may also serve as a value for the determination of prices for various grades of size. This test was carried out with the apparatus of Messrs. G. Falter & Son, Munich, with the exception that another kind of wood was used instead of beechwood for the blocks, it being found that more comparable and concordant results were obtained when making large numbers of tests. According to Kiessling, the melting point which size possesses at a given dilution should afford information as to the adhesive power of various kinds. His method is to dissolve one part of size in two parts of water at 70° C., allow to gelatinize at 15° C., and then to take the melting point at least two hours after it has reached the latter temperature. He gives the following table for the values of various grades of size:

Best grade. Melting point above 30° C.

Good grade. Melting point above 26° to 30° C.

Medium grade. Melting point above 22° to 26° C.

Low grade. Melting point below 22° C.

This method has been tried on a series of different grades of size, and

has been found of considerable value; it can be carried out in a comparatively short time, and provides a very wide range for the various grades of quality. Experiments so far go to show that there is undoubtedly a relationship between the melting point and adhesive power of size, and it may therefore be assumed that the lower the melting point is the less is its adhesive power. As will be seen from the above description the size during its examination is never subjected to higher temperature than 70° to 80° C. The idea that size gains in adhesive power by prolonged boiling is quite fallacious. Experiment proves the exact opposite. If a sample of size, dissolved as above described, be boiled down to half its volume and then made up to the original volume with hot water, it will be found that although the consistency is the same the adhesive power is only one-half of what it was. The lowering of the melting point is also similar. The melting point of the jelly boiled in the same way and again brought to the right consistency is from 7° to 10° C. lower. Determinations of adhesive power and melting point were made on samples of size dissolved without boiling, and also on samples which had been boiled down; and it is believed that an approximately correct value for the quality of a size has now been obtained from such experiments.—*Wochenblatt für Papierfabrikation.*



--Consul Macdonald, in a report on the trade of Bilbao, Spain, for the year 1902, speaking of wood pulp, says: "Ten thousand two hundred and thirty-nine tons of wood pulp, imported in 1902, point to an article which may become worth the attention of Canadian producers. At present Norway supplies nearly the whole of this, which is said in Bilbao to be superior to the Canadian, but price is probably the decisive factor. Norwegian pulp costs 11 fr. per 100 kilos (say 4s. 5d. per cwt.) francs Bilbao, against Canadian 5s." Of the

10,239 tons imported, Norway supplied 7,049 tons; Sweden, 290 tons; Holland, 1,446 tons; Belgium, 1,182 tons; Germany, 139 tons; and Russia, 133 tons. The total shows an increase of 463 tons compared with the total quantity in the previous year.



LOSS ON CHLORIDE OF LIME.

A writer in *La Papeterie*, dealing with the instability of chloride of lime, and the effect of light and temperature in diminishing its strength, says: Patterson, in *Watt's Dictionary of Chemistry* says that chloride of lime loses from 0.28 to 0.33 per cent. in the spring and nearly 0.86 per cent. in summer if kept in badly-stoppered bottles. His experiments with well-stoppered bottles show a loss of 0.02 per cent. in twelve months; in casks the loss in twelve months was 3.2 per cent. Not knowing exactly the conditions under which the above-mentioned experiments were carried out, the author has not been able in his numerous trials to realize the conditions under which the loss was as small as above described. He has found that this loss in bottles well stoppered and kept in the dark, the stoppers being covered with sealing wax or paraffin wax, amounted to about 1.5 per cent. per month if the lime is kept between 20° and 30° C. A sample so kept for nearly eight months made a loud noise when the bottle was opened, showing that gas continues to be evolved under the above conditions. When the bottles are not sealed with sealing wax or paraffin wax, the loss varies even if the chloride of lime be kept in a cold and dark place. At the end of twelve months a 30.4 per cent. sample only yielded 17.85 per cent, i.e., a loss of 12.55 per cent. At the end of six months a 34.0 per cent. sample yielded only 29.25 per cent., loss = 4.75 per cent. At the end of four months a 32.3 per cent. sample was reduced to 27.00 per cent. loss = 5.30 per cent. Finally, a 25.4 per cent. sample yielded

only 20.10 per cent. at the end of two months, loss = 5.30 per cent. Compared with iron drums, wooden casks give the following results:

No of days.	I	II	19	25	29	36	43	54
Drums	31.50	30.00	29.20	27.00	21.20	16.97	.....	.....
Casks	33.92	33.40	30.00	29.55	28.25	27.30	26.00	24.68

It is usually said that a well-sealed drum ought to keep chloride of lime better than a cask; experience, however, reverses this theory, as the above comparison shows without a doubt that the chlorine acts upon the iron of the drum. In a cask kept in a dry and dark place, but not so dry as to cause the wood to split, chloride of lime keeps remarkably well. It might possibly keep still better in casks which previously contained alcohol or wine.



DROUGHT, FLOOD AND FORESTRY.

As enforcing the warnings given in our August number concerning the effect of indiscriminate forest destruction on climate and soil, we commend to the Premier of Québec the following letter recently written by Arthur Goadby to the New York Times:

There has been much moralizing of late over the destruction caused by drought and flood, and in the churches prayers have been offered petitioning that Providence may spare us further visitation. The West has supplicated in tears, the East in sackcloth and ashes. But if a man deliberately cuts off his hand, is it reasonable for him to suppose that a miracle will restore it?

The Deity has placed us in a sphere of cause and effect, and we are here presumably to learn. But when in the hasty pursuit of wealth we have destroyed our beautiful forests, so that snow melting on the denuded plains causes floods, and hot air rising from the sun-baked, treeless slopes causes droughts, then it is far more dignified for us to ask of the Deity, not miraculous rains, but a little more wisdom, a little more reverence for the temple of nature, wherein

he has placed us. We must learn that we reap what we sow; we can expect no mercy where we have shown none. Nor is it expedient for us to pray for rains

lest at this juncture our western neighbors be flooded still more.

Last spring I passed through what was once perhaps the most beautiful forest in the world, the Appalachian forests of the United States. I saw vast reaches of mountains, slopes, and coast where there had formerly stood veritable monarchs of the forests, trees a hundred feet high, the product of thousands of years of spontaneous culture, but now swept away in a single generation. I saw rivers choked with great trunks of trees, sawmills working almost day and night, special railways built for carrying lumber from the valleys. I saw a scene of pitiful waste and desolation. I saw an industry that in a few years must cease for lack of material to destroy.

Here was once a vast stretch of land from Georgia to Maine, once beautiful, luxuriant, in climate equable and exhilarating, where sufficient rains alternated with sunshine, the nursery, too, of a vigorous race. But now it was being reduced into a monotonous, dry, smoky, timberless, black-stumped region, where drought and deluge would work their alternate disaster.

I was in the Alleghanies in the spring of the year, and I saw where the snow had melted upon the slopes of the mountains. There was no longer any shade to stay the heat, nor roots to hold the rain. In a few days the waters had risen over the dams and swept them away. They rushed through the gorges and carried down bridges, trestles, and houses. I saw water spouting from hillsides until valleys were flooded and villages swept away. But higher up along the ridges of the mountains the lumbermen were plainly visible, and they were blasting away and hewing down the trees, and I thought, "After them the deluge."

We have dried up the numberless springs until there is no longer a steady percolation of moisture through the atmosphere, and drought induces drought, just as moisture induces moisture. Nature's equilibrium has been disturbed, and nowadays, when we have a "little weather," we may generally expect "more of it." We have taken away from the hills those billions of natural dams, and no longer is there safety to many of our towns. Moreover, each year more damage is done to agriculture by the removal of trees than years can ever repair.

Who is responsible for these conditions? First, the Congress of the United States and the State Legislatures, who have refused to heed the warnings of State foresters and naturalists, and have permitted the wholesale destruction of the forests by the lumber companies. Secondly, to the people themselves, whose greed for sudden wealth has neglected every other consideration. They have cut down already the trees that bore their golden apples. Those trees will bear no more. Thirdly, the departments of education who have discoursed profoundly on ancient learning while the wondrous flora and fauna of our own country were being annihilated around them. And lastly, to those "scientific" foresters themselves who had set out to delay forest destruction, and yet did not love trees for themselves, but were only wisely mercenary about them.

In fact, it has been cupidity all the way through, and we have tried to turn our country into gold until its dust puckers the mouth. But we cannot escape the consequences of all this. It must affect the race. Already there is less forest land proportionately in our country than there is in Germany.

One has but to look back through history to see how closely related is the forest to human vitality. It was in the forests of Thessaly that the early Greeks received their energy that later flowered into genius. It was the forest dwellers of Germany that conquered decadent

Rome, and that later gave to Spain the vigor that swept back the Moor and brought under her flag almost the whole known world. But to-day what is Greece, what is Italy, what is Spain? They have been stripped of their forests, those nurseries of vigor, and their decay has set in. Everywhere the law holds good. It is in the forest that the manhood is nourished which builds up great civilizations. But cities arise, trees are swept away, and the inevitable decline sets in. Forests once destroyed cannot return, and over all the sites of ancient civilizations are blowing the desert sands.

But the pall of smoke that for days hovered over our heads showed us that we have yet trees to burn. How can we repair destruction? There is only one way: We must first start a campaign of education. We must learn to realize the dependence of human vitality upon trees and forests, of agriculture upon those equable conditions that are themselves due to forests. We must show that the water supply of our great cities comes from the myriads of minute brooks and rivulets that lie out fanlike upon the mountain slopes and form the headwaters, and which are quickly dried up unless protected by the arching foliage of the trees. We must learn that floods sweep down into the seas all that rich surface of the earth, the loam, the vegetable mold so rich in nitrates, so essential to a fertile soil.

And lastly we must turn back to the love of nature for herself; to an appreciation of the beauty of natural scenery, to the glories of autumnal woods, the naivete and smiling charm of spring, the joyousness of nature's moods in summer, the genial glow of winter. We must read more frequently the works of the great poets of nature—Wordsworth, Shakespeare, Herrick, Longfellow, Whittier, Bryant. We must never outgrow our boyish delight in woodcraft, and above all, we must cultivate a love for trees. We should be able to name them and know how to plant and care for them. If we can we should plant a few every year, and see that there were more

parks provided for in our growing suburbs; that our avenues and streets were broader and more shaded with trees, and that we establish great forest preserves in every State.

Meanwhile must we see the destruction of our woods by axe and fire go on? Can we save what remains? Not unless the people, the legislators, the editors, the agriculturists shall act. Possibly a few more annual floods, a few more destructive fires will soon instruct us that nature may have her diseases as well as men, and that these diseases are due to transgressions of law on the part of man himself.



THE VICTORY SCREEN.

The Watertown, N.Y., correspondent of the Paper Trade Journal writes: A decision handed down by Justice Ray, of the United States Circuit Court, in the case of the Edward Victory estate against the International Paper Company, is of much interest to all paper manufacturers using diaphragm section screens made prior to five or six years ago, as the decision establishes the validity of the Victory patents and fixes damages at \$50 for each machine infringing such patents. The case in question is interesting, as it shows the trials of a man whose invention made a fortune for others, but who realized little on it before his death.

In 1889 a patent was issued to Edward Victory and Charles R. Remington, of this city, on a pulp screen. Mr. Victory was a superintendent in Mr. Remington's paper mill. After the patents were secured, Mr. Remington assigned his interest to Mr. Victory. An arrangement was effected whereby D. B. Gotham, then proprietor of the Brownville Iron Works, was to build some of the screens for the local mills. When it was found that the screen was something of real merit and far ahead of anything then in use, Mr. Gotham continued their manufacture, putting them out under his own name and ignoring the inventor. The screen found its way into a majority of

the paper and pulp mills in the United States and Canada. In 1891, Victory began a suit for infringement on his patents. The litigation has dragged through the courts since. Mr. Gotham amassed a fortune and sold his business several years ago to a corporation. The managers of the new concern at once adjusted matters with Mr. Victory, who was then living, and all purchasers of Gotham screens since manufactured, it is understood, are not affected by the present decision. If the decision of Judge Ray stands, it would appear that all purchasers and users of the screen prior to the time the present manufacturers acquired the patents and the right to build and sell them are liable for the \$50 royalty on each machine. If this is so, there is a possibility of suits being brought against D. B. Gotham, who manufactured and sold the machine, to recover the amount paid in royalties. In the case just decided in favor of the estate of Edward Victory, who died a couple of years ago, the judgment against the International Paper Company amounts to \$4,250. The decision establishes the Brownville Iron Works, managed by Charles N. Sherman, of this city, as the only concern that has a right in the United States to construct and sell the screen under the Victory patents, and all purchasers since the Brownville Iron Works acquired these rights are of course fully protected.



—Considering the growing importance of the pulp and paper industry in Canada, there should be plenty of scope for a trade journal, and judging from the first two numbers of the Pulp and Paper Magazine, published monthly by Biggar-Samuel, Limited, of Toronto, the interests of manufacturers bid fair to be keenly studied and advanced in every possible direction. Amongst the interesting contents are included descriptions and illustrations of the leading Canadian mills. The magazine is attractive in appearance and well printed.—World's Paper Trade Review.

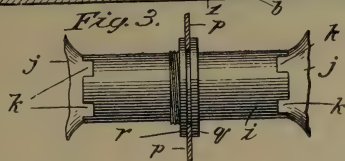
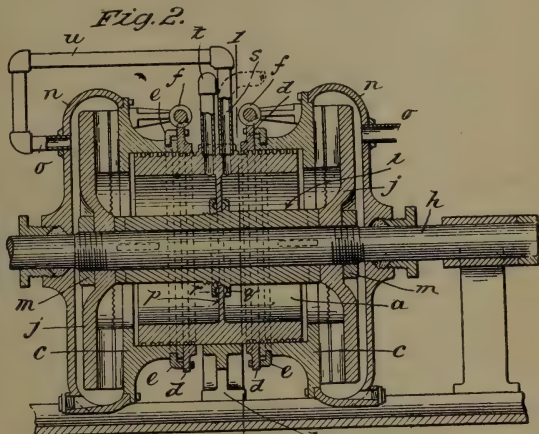
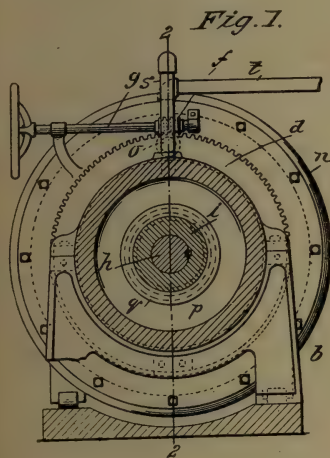
IMPROVED REFINING ENGINE.

George A. Clark, of Holyoke and Hiland R. Farnsworth, of Turner's Falls, Mass., Edward P. Bagg, administrator of said Clark, deceased, have been granted a United States patent on a refining engine.

This invention relates to the construction of refining engine for paper pulp, and it is in the nature of an improvement on letters patent of the United States issued to George A. Clark, on March 25th, 1902, numbered 696,314; and the object of the invention is to pro-

vements. Fig. 2 is a longitudinal sectional view of the same. The plane of the section on which Figs. 1 and 2 are taken is indicated by line 1 1 on Fig. 2 and line 2 2 on Fig. 1. Fig 3 is a side elevation of a sleeve keyed on the main shaft and illustrating the connection of the heads therewith and also showing more clearly than do the other figures the connection between it and a thin partition which divides the body of the machine transversely.

This machine, as a whole, is the same as that forming the subject of the said prior patent. Upon a cylindrical body



vide a construction which embodies all the general features of that patent, and in addition thereto provides means whereby the pulp refining devices of the prior construction may be used separately, either for the purpose of running pulp of different qualities or different colors through the machine simultaneously, one kind through each head, or for the purpose of passing pulp first through one end of the machine and then through the other, so that the same pulp may receive two separate treatments whereby it may be more thoroughly refined.

Fig. 1 is a transverse sectional view of a refining engine embodying the im-

provements. Fig. 2 is a longitudinal sectional view of the same. The plane of the section on which Figs. 1 and 2 are taken is indicated by line 1 1 on Fig. 2 and line 2 2 on Fig. 1. Fig 3 is a side elevation of a sleeve keyed on the main shaft and illustrating the connection of the heads therewith and also showing more clearly than do the other figures the connection between it and a thin partition which divides the body of the machine transversely.

This machine, as a whole, is the same as that forming the subject of the said prior patent. Upon a cylindrical body *a*, which is supported in a suitable frame *b*, located substantially midway between its ends, there are mounted two circular plates *c*, one on each end of said body, which have a sliding movement axially on the body. Each end of the latter is screw threaded and a nut *d* is screwed on to each end, and each of the heads is connected to one of these nuts in such a manner that the nut may be rotated to adjust the head toward and from the head of the body. This connection consists of an angular plate *e* which is bolted to the nut and provided with a turned in edge which engages a groove extending circumferentially around the head. The periphery of these nuts has

gear teeth cut thereon with which a worm gear *f* meshes, whereby these nuts may be rotated, said worm gear being mounted upon a shaft *g* and provided with a suitable hand wheel. Through the cylindrical body *a*, the main shaft *h* passes, supported at either end in suitable bearings, and on that portion of the shaft which lies within the body a sleeve *i* is keyed. Against each end of this sleeve and interlocking therewith there is mounted upon the shaft *h* a head *j*. Both the contiguous surfaces of the head *j* and the circular plates *c* are provided with blades practically the same as those that are used in all refining engines, and these are generally arranged in a substantially radial position on these parts. In Fig. 3 of the drawings the manner of interlocking these heads *j* with the sleeve *i*, whereby the two heads become practically one member, is shown, and it consists in forming on the hub of the head *j* the projections *k*, which enter similarly formed notches in the ends of the sleeve, and when the heads are so placed screwing up a nut *m* against each head, whereby these are held in interlocking engagement with the sleeve.

It will be readily understood that with a head *j* on either end of the body of the machine, if these heads were keyed on to the shaft, it would be practically impossible to remove one of the heads, as there would be no means of driving the key out; but by the construction shown herein either head may be removed at will by unscrewing the nut *m*, and sliding the head off the shaft.

A casing *n*, secured to the plates *c*, encircles each end of the machine, and from this casing the pulp which has passed between the plate and the head passes out through a suitable discharge pipe, which is indicated by *o*, for both ends of the machine.

In carrying out this invention a partition *p* is provided, which is located transversely of the interior of the body *a*. This partition, preferably, is cast on the body. To provide against the passage of any pulp between the inner edge of the partition and the surface of the

sleeve *i*, the latter is provided with an annular flange *q*, cast thereon in such position that when the sleeve *i* is in its place within the body, the side of this flange will lie close against the side of the partition *p*, and against the opposite side of this partition a nut *r*, threaded on the sleeve *i*, is screwed up. The sides of this flange and nut may be slightly concaved, as shown in Fig. 2, if desired, for the reception of some suitable packing. It is only necessary, to provide a light contact with the partition to prevent the passage of pulp from one side thereof to the other. An inlet pipe *s*, located on one side of the partition, will supply pulp to one end of the machine, and another inlet pipe *t*, located on the other side of the partition, supplies pulp to the opposite end. These inlet pipes *s* and *t* may receive pulp from different sources of different qualities or colors, and that which is reduced on one side of the partition may be taken to one machine and that reduced on the opposite side to another, or these supply pipes may be connected up, as shown in Fig. 2, in which *t* is the inlet pipe for both ends of the machine considered as source of supply, the other inlet pipe *s*, being connected with the discharge pipe *o* of that end of the machine with which the pipe *t* is in communication. In this case the course of the pulp would be through the pipe *t*, then through the head at the left hand end of the machine, out of the discharge pipe *o*, and then through a pipe (indicated by *u*), and communicating with the inlet pipe *s*, through which the pulp will enter the machine on the opposite side of the partition *p*, and from thence pass out of the discharge pipe *o* at the right hand end of the machine. With this construction pulp can be sent through one end of the machine first and then through the other, whereby it may be subjected to a much more complete treatment, and thereby better adapted to certain classes of paper. Furthermore, with the machine provided with two separate inlets, it is exceedingly useful in that two grades or two colors of pulp, which are frequently used at the same time on the

same machine—as, for example, on cylinder machines for making paper which is of one color on one side and of another on the opposite side—or in the same class of machines wherein the centre of the paper is of coarse material and the two sides lined with a finer grade.

It is thus seen that the improvements set forth in this application adapt the machine to many uses to which the machine forming the subject matter of the said prior patent is not adapted.

It is, of course, well understood that there are several ways in which the partition *p* might be secured to the body *a* in a proper position and in a manner to perform its functions satisfactorily.—Paper Trade Journal.

JORDAN ENGINE.

Charles Sands Elder, of Westbrooke, Me., has been granted a patent in the United States for a Jordan engine. "As heretofore constructed," says the inventor, "the Jordan engine consisted of a conical shaped shell having a series of angular cutting knives extending in a longitudinal direction and spaced apart circumferentially around the interior of the shell. These have generally been arranged in two or more series and spaced apart substantially equidistant except that at four points ninety degrees apart the knives and blocks were varied by the insertion of what may be called keying blocks. These consist of a front and back block, each having a straight side and an angular side, and the key proper having two straight sides, whereby it is adapted to be driven in between the back and front blocks, and thus made to hold the blocks and knives firmly in position. No knives have been used between the key proper and the front and back blocks, thus leaving a considerable open space, which interfered more or less with the uniform beating up of the pulp.

The inventor goes on to claim:

"My invention consists broadly, first, in interposing straight knives with the

angular knives; secondly, in inserting straight knives between the front and back key blocks and the key proper, and thirdly, in making the keying block proper laminated, which can be done by my improved construction, since the edge of the keying block proper comes directly against the knives."

In the drawings Fig. 1 is a front ele-

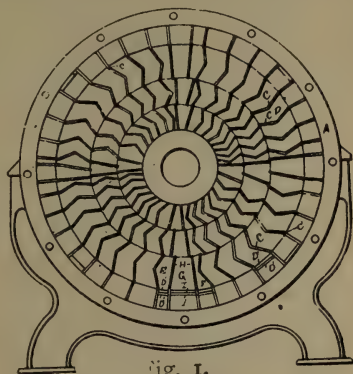


Fig. 1.

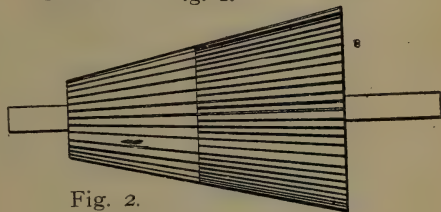


Fig. 2.

vation of the shell of the engine, the plug being removed and only enough of the blocks being shown laminated to illustrate the construction of the blocks, and Fig. 2 is a plan view of the plug removed from the shell. The construction and operation of these, apart from the improvements hereinbefore referred to, are the same as in the ordinary Jordan engine. A represents the shell of the engine and B the plug. Spaced apart circumferentially around the shell are a series of angular cutting knives C, extending longitudinally thereof, and interposed between said knives are angular spacing blocks D. The knives are designed to project slightly above the face of the blocks, as seen at C'. These knives wear in use, and it has been the custom when the knives have worn close to the blocks to remove the plug and chip the surface of the blocks between the knives without taking them

out. To facilitate this chipping it has been customary to make the blocks laminated, the several laminae D' being glued together. At certain points in the shell (here shown at four points distant from each other ninety degrees), are inserted keys, which firmly lock the knives and blocks in position. The keys consist of the front blocks E , the back blocks F , having one straight side and one angular side, and the key proper, G . Interposed between the straight sides of the back block and front block and the key proper are straight knives H . The key proper is made up of two or more laminae I .

Independent of the fact that the straight knives fill the large vacant space otherwise required by the three blocks which go to make up a key, the inventor claims that the straight knives, combined with the angular knives, accomplish a much more effective and uniform beating up of the pulp than is the case when only angular knives are employed, and he does not intend to limit himself to the use of the straight knives solely between the members which form the key, but the use of straight knives in combination with angular knives in any way is equally within the terms and spirit of the invention.

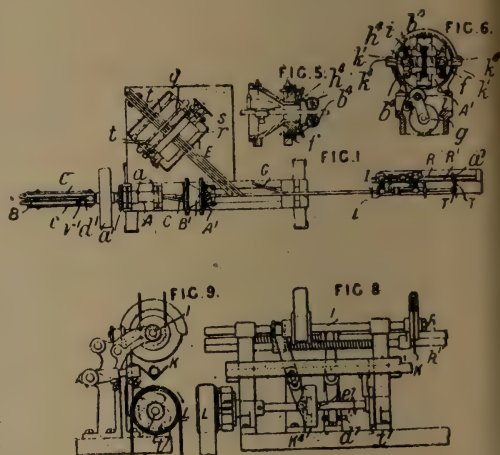
The advantages of the improved engine are said to be that the plug need not be run so close to the shell, lessening the wear on the knives and the power necessary to run the engine; that it lessens the time required to chip the engine, and that it improves the quality of the product, lessening the waste.



PAPER TUBE MACHINE.

An apparatus for making paper tubes has been patented by T. Denney. The sleeve A is hollow, is revolved by the wheel a^1 , and is attached to the mandrel C , upon which the tube material is wound. Extending from the hollow revolvable sleeve A is the fork c carrying the paper reel B . The ribbon d^1 passes through the sleeve A , is pressed by the

spring v^1 , and is wrapped spirally on the mandrel C , being fed by the means shown in Figs. 5 and 6. The grooved feed rolls b^4 are carried by the revolving head A^1 , which is driven by the spur wheel f from the spur wheel of the sleeve A . The feed rolls are carried



bodily around the mandrel in the same direction as the mandrel rotates, but with only about one-half the speed, and serve the double purpose of regulating the revolvable speed of the core upon the mandrel and of feeding the core longitudinally along the mandrel. The head A^1 and the barrel B^1 rotate at different speeds, and motion is transmitted to the feed rolls through the gears h^4 , k^4 , and the worms k^1 and the wheels i . The barrel B^1 has an intermittent rotating movement in a direction opposite to the head, arising from a cam and ratchet movement through a shaft parallel to and worked from the shaft g . A hand lever, which controls a swinging bar, and so controls the cam movement imparted, provides for any modification that may be desired in the speed of the feed rolls carried by the head. To complete the tube, a number of stripes are wound spirally around the core formed on the mandrel. The paste box E is provided with a paste-feeding roller r , a paper-feeding roll s , a scraping roller q , and tension bars t . A gas burner G may be provided to dry the material as it passes along. The tube

formed is cut automatically by the circular saw K. The shaft I of the saw is moved longitudinally by the cam K⁴ at the same speed at which the tube to be cut is travelling. The pulley L only rotates the cam K⁴ when the cam is free; when the stud d⁷ and the stud e⁷ engage, the pulley L runs free as when the bar R is retracted and the saw is idle. The cam t⁷ lifts the tube against the saw. When the end of the tube passes off, it strikes the plate T⁷ on the lever T and, moving the lever against the stop a⁷ on the rod R, causes the rod R to slide and bring its stud d⁷ away from the cam K⁴.—World's Paper Trade Review.



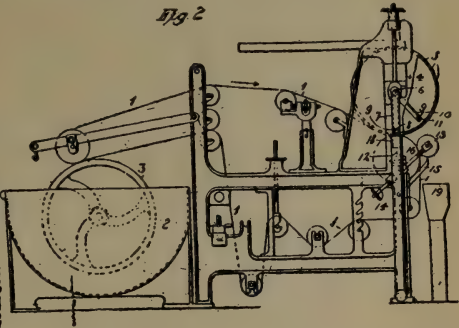
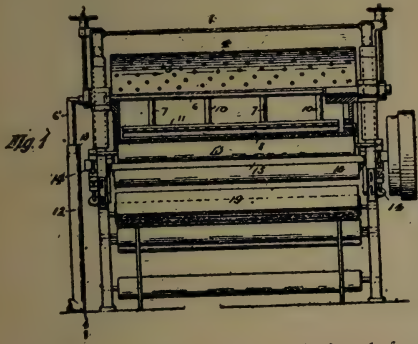
PULP PERFORATING ATTACHMENT.

Gustaf Samuel Lindberg, of Gothenburg, Sweden, has got a United States patent for an apparatus and method of perforating wood pulp directly on a papermaking machine. The object of the perforations may be partly to satisfy provisions in the custom house regulations of some countries that only per-

ficient thickness, it being then cut open in usual manner and removed from the roller. The refuse or waste produced in the piercing or perforating operation is carried along by the felt and taken from the latter by a special roll, from which it is removed by means of a scraper, brush, or the like.

The take-up roller is perforated to conform to the desired perforations of the pulp sheet, and within the roller near its periphery are located tubes, which are perforated at the side adjoining the shell of the roller with a longitudinal row of holes corresponding with those in the take-up roller. Into the pipes is forced air or water, which, when a row of holes in the take-up roller is brought opposite the holes in the pipe, blows away the thin and moist pulp layer covering the former holes. In the drawings, Fig. 1 is an end view of the apparatus, partly in section; and Fig. 2 is a side view, partly in section.

The felt 1 receives the pulp from the making-cylinder 3, located in the reservoir 2, and delivers it in usual manner to the take-up roller 4 at the point



forated wood pulp will be admitted free of duty, or draw but slight duty, and partly to form a trade mark, designate a firm name, or the like.

In carrying out the invention the wood pulp is deposited on the take-up roller and is subjected to the piercing action of air or water jets determined by apertures in the roller and acting on the pulp when passing in its damp state from the felt to the take-up roller. This continues until the pulp collected on the take-up roller has obtained suf-

where the latter and the felt-guiding roller 16 are in contact with each other. The roller 4 is provided with apertures 5 to conform to the desired perforations, as seen from Figs. 1 and 2, in the latter figure partly in section. Through one gudgeon of the roller 4 is inserted a pipe 6, extending to the opposite end of the roller and here resting in a suitable socket or bearing. From the pipe 6 project downward four pipes, two of which, 7, are joined to and support a tube 8, located at the lowest point

within the roller opposite the guide-roller 10.

The tube 8 is quite close to the shell of the guide-roller, and is provided on the side adjoining the roller with a row of holes 9, corresponding to those in the roller 4. The two other pipes 10 lead to and sustain another tube 11, located within the roller 4, said tube resembling the tube 8, but being situated at some little distance from the latter in the direction of rotation of the roller. This tube 11 is also provided with perforations 9, similar to those in tube 8. The tube 6 communicates through a pipe 12 with some main pipe common to several machines, the main pipe issuing from the pump, blowing-engine, or the like, by means of which the liquid or air pressure is produced. The pipe 12 has at 18 a joint where the lower end of the vertical portion 6' of pipe 6 is inserted, so as to allow the pipe to lengthen or shorten and accordingly the roller 4 to rise or descend freely.

In contact with the felt at the roller 16 is, moreover, located a roller 13, past which the felt moves shortly after being in contact with roller 4. The roller 13 is journaled on sliding bars 14, arranged so as to allow of the roller being pressed by means of them against the felt and caused to take up pulp from the latter. On the roller 13 bears a scraper 15 or the like. According as the perforations of the roller 4 in the rotation of the latter arrive opposite the holes of the tube 8 the wood pulp deposited over the perforations of the take-up roller is blown back to the felt, or the pulp is prevented from depositing over the perforations of the take-up roller, depending on whether the pulp has begun to be lifted by the take-up roller from the felt or not, which again depends on the position of the tube 8, which may be slightly to the right of the line passing through the centre of the two rollers 4, 16, but preferably should just coincide with said line, as shown in Fig. 2.

As the blowing is repeated after the pulp is deposited on the roller 4, the sheet of pulp when completed will be

provided with holes having quite a clearly-defined edge or outline. As a consequence, smaller perforations arranged to form a trade-mark or the like may likewise be produced in the manner described, the take-up roller being in this case provided with perforations to correspond. The tube 11 serves to blow away any pulp which may have chanced to remain in the apertures of the roller 4, so as to keep the latter apertures perfectly clean. The pulp caused by the perforating device to remain on the felt is taken up by the roller 13 bearing yieldingly on the latter. The scraping iron or knife 15, in place of which may be substituted a brush or the like, removes the pulp from roller 13, which pulp drops into the box 19, which is emptied into reservoir 2 when required.

Should it be desired at times to make unperforated sheets of pulp, the apertures of the roller 4 are closed up by plugs especially provided for the purpose, and arranged to be readily removed or inserted, as required. In manufacturing unperforated sheets the air or liquid conduit 12 is shut off and the roller 13 and box 19 are removed.



UNITED STATES FOREST PRODUCTS.

The Department of Trade and Commerce, at Washington, has issued the following statement on United States trade in the products of the forest, including manufactured and raw materials:

Forest products enter more extensively into the foreign commerce of the United States than is generally appreciated, the imports during the fiscal year 1902 amounting to nearly \$60,000,000 worth, and the exports reaching almost \$50,000,000. While at present importation exceeds exportation, the trend of trade during recent years seems to indicate that the situation may soon be reversed. Ten years ago the imports were valued at \$50,000,000 and the exports at only \$28,000,000, the imports in the decade increasing less than \$10,000,000, while the exports gained more than \$20,000,000.

The forest products imported into the United States come largely from tropical countries, and differ strikingly in character from those exported. The principal item among the imports is the several gums from which rubber is made. Lumber also ranks high in this branch of the import trade, coming particularly from Canada. Tropical countries are depended upon almost exclusively for cabinet woods, especially mahogany, and they also supply the dyewoods. Wood pulp and cork are notable forest products derived from temperate sources.

Our imports during 1902 of the gums used for rubber making amount in the aggregate to 67,790,000 pounds, valued at \$25,653,000. Of India rubber, which was the principal item, 50,413,000 pounds, worth \$24,899,000, were imported. Most of the India rubber came from Brazil. Gutta-joolatong, or East India gum, was imported to the extent of 16,851,000 pounds, the value being \$501,000. Our supply of gutta-percha, amounting to 526,000 pounds, with a value of \$252,000, was purchased largely in the markets of the United Kingdom and Germany.

Of wood in its various forms, not including dye woods, there were imports last year worth \$19,621,000. Lumber formed the principal item under this head, the import value amounting to \$12,015,000. During 1902, boards, deals, planks, and other sawed lumber were imported to the extent of 665,603,000 feet, valued at \$9,271,000. Practically all of this sawed lumber was of Canadian origin. There was also a heavy importation of shingles from Canada, the number received being 707,614,000, and the value \$1,363,000. Shingles were not imported from any other source. Various kinds of lumber other than those specified were also imported, forming together an item of \$1,381,000, chiefly from Canada.

In addition to lumber, \$925,000 worth of timber was received from foreign countries, chiefly from Canada. The principal part of this timber was imported round or in the form of logs. Our imports of timber in that form

amounted in quantity to 106,171,000 feet, and had a value of \$907,000. Of timber that had been hewn, squared, or sided, we imported 129,000 cubic feet, the value being \$18,000.

The cabinet woods imported during 1902 were valued at \$3,361,000. Of mahogany, which was by far the most important item, 44,795,000 feet were received, the value amounting to \$2,361,000. Nicaragua, Mexico, and Cuba were the countries that produced most of the mahogany imported. Large quantities of this wood, however, were received indirectly through the markets of the United Kingdom. The various other cabinet woods imported in 1902 had an aggregate value of about \$1,000,000. They came from many tropical countries, but in largest quantities from Cuba and Mexico. Several gums, other than those used in rubber making, were imported quite extensively during 1902, their combined value amounting to \$7,744,000. Gum arabic was received to the extent of 4,269,000 pounds, the value being \$342,000. Egypt supplied the principal part.

Our imports of wood pulp in 1902 amounted to 67,000 tons, worth \$2,059,000. Canada being the leading source of supply, although large quantities came from Sweden and Norway, and from Germany. Portugal and Spain furnished cork wood and cork bark valued at \$1,816,000. Of the \$1,159,000 worth of dye goods, 53,000 tons of log wood, worth \$774,000, came mostly from Hayti and the British West Indies.

The Netherlands, the United Kingdom, and Germany contributed to our markets 3,723,000 pounds of cinchona bark, worth \$650,000. Ecuador and Colombia sent us 14,699,000 pounds of vegetable ivory, worth \$165,000, and Italy was the principal source of supply of ground sumac, which was imported to the extent of 9,183,000 pounds, valued at \$146,000.

Wood is decidedly the most important factor in our forest products export trade, having amounted last year to \$26,000,000, approximately for lumber, and \$10,000,000 for timber. Under the

head of lumber the principal export items were boards, deals, and planks, aggregating 942,814,000 feet, worth \$16,978,000, the United Kingdom, Canada, Mexico, the Netherlands, and Argentina furnishing the chief markets, while Belgium, Cuba, British Australasia, Germany, and British Africa were large buyers. During the year 45,999,000 staves, worth \$3,830,000, were sold to France the United Kingdom, Spain, Portugal, Holland, Germany and Italy. Shooks formed an export item of \$1,499,000.

Exports of joists and scantling amounted to 37,885,000 feet, value \$472,000. Argentina, Cuba, the British West Indies, Mexico, and Canada were the principal markets.

During last year, 33,224,000 shingles valued at \$87,000, were shipped from the United States going chiefly to the British West Indies, Canada, and Mexico. Unenumerated lumber articles were exported to the value of \$3,572,000. The United Kingdom, Mexico, Canada, and Germany were the principal countries of destination for these unclassified exports.

Our shipments of round timber, or timber in the log, in 1902, were valued at \$3,344,000, the leading markets being found in the United Kingdom, Germany, Canada, the Netherlands, Mexico, and France. Hewn timber exported to the extent of 5,388,000 cubic feet, worth \$1,031,000, went chiefly to the United Kingdom, Canada, Mexico, and Cuba. Of sawed timber, which was the principal variety exported, there were shipments amounting in value to \$5,225,000, the quantity being 412,750,000 feet.

Spirits of turpentine was exported during 1902 to the extent of 19,178,000 gallons, the value being \$7,431,000. Nearly half of these exports found a market in the United Kingdom. Other countries that bought extensively were Germany, Belgium, and the Netherlands. Of rosin we exported 2,536,000 barrels, worth \$4,202,000. The United Kingdom, Germany, the Netherlands, and Brazil, were the largest purchasers.

Our shipments of tar for 1902

amounted to 23,000 barrels, and were valued at \$56,000. We sold this product in large quantities to the United Kingdom, Canada, Mexico, and British Australasia. Turpentine and pitch were marketed abroad to the extent of 18,000 barrels, the value being \$44,000. Canada, the United Kingdom, Germany, Cuba, and British Guiana made the largest purchases.

Last year the United States exported 38,249,000 pounds of wood pulp, worth \$740,000. A large part of this pulp was marketed in two countries—the United Kingdom and Belgium. Among the remaining destinations Germany, Italy, and France stood foremost.



—Popular Mechanics says that the making of carbon paper and typewriting ribbons is a trade secret known to scarcely two dozen people in the world. So carefully is it kept that it has never been patented. It is said to be simple and inexpensive, if only the secret of the composition were known. The secret remains with the families of the original discoverers.



—G. A. F., in the World's Paper Trade Review, thus estimates the tendency of British opinion on the new fiscal policy, as it affects the paper trade: As far as I can gather from almost daily opportunities of conversing with manufacturers and business men on the future question of the fiscal policy of the country, the general feeling seems to run in this groove: food imports must not be taxed, and strictly raw materials must also be free. It is quite natural, if somewhat inconsistent, and not altogether in consonance with economic principle, to find that there is a growing disposition to "regulate" the importation of strictly manufactured goods. As applied to the paper trade, this would mean that paper-making materials, such as wood pulp, esparto, rags, etc., should be imported free, but that manufactured paper, in sheet or reel, or as part-constituent of other goods, should be subject to "regulation."

Mill Matters

The new pulp mill at Ottawa, owned by J. R. Booth, will be completed next month.

The E. B. Eddy Co., of Hull, have built a new flume for their paper mills, and have installed two new grinders in one of their pulp mills.

Horace H. Thayer, Jr., representing the Pusey & Jones Co., manufacturers of paper and pulp machinery, of Wilmington, Delaware, was in Montreal this month. Mr. Thayer was impressed with the solid and business-like appearance of the city.

The company referred to last month as having acquired water power and timber limits along the Powell river in British Columbia, and with which the name of Benton E. Turner, of New York, is associated, is the Pacific Coast Power Co., which has been granted a provincial charter. The company proposes to erect pulp and paper mills, and agrees to spend \$50,000 before next January in developing the property.

The Labrador expedition, organized by Col. Wm. Glazier, of New York, referred to in a recent issue, has failed owing to lack of equipment. The party appears to have started inland without canoes, tents or sufficient provisions, and had only one Esquimo as a voyageur. Dr. Binion, the scientist of the party, was taken ill and had to be brought back. The members had to exist on hard tack and the few fish they could catch.

In a recent interview on a trip he made through the Lake Nepigon region D. T. Burke, of Port Arthur, said: "Spruce occupies the large clay belt running from Lake St. Joe to Lake Nepigon. This belt is 600 miles long and in some places 100 miles in width. The route of the Grand Trunk Pacific Railway will carry it right through this clay belt. It is safe to say that there will be millions of cords of pulp wood along the line of that road in Ontario alone. In some places the spruce will turn out

pulp wood at the rate of 100 cords to the acre, but, of course, the average is much below this." The country, according to Mr. Burke, is one-fifth water, there being many streams running into Lake Nepigon and Lake Superior, but the pulp wood will be moved best by means of the colonization railroads, rather than by the streams. The Nepigon country has escaped the fires which in former years have swept the country round-about.

Action has been entered in Hull Superior Court by George Pelletier against the E. B. Eddy Company, Limited, paper manufacturers, for damages to the amount of \$1,999. Plaintiff is a policeman, and the action arises out of the death of his fifteen-year-old son, who, while employed as screen boy in the company's mills stepped upon a projecting nail, which penetrated his heel, caused blood-poisoning, and resulted in death.

A start has been made in manufacturing at the Imperial Paper Mills at Sturgeon Falls, with C. W. Rantoul, a paper mill man of large experience in the United States, as manager. It is the intention of the company to export finished paper and not make any special efforts at shipping pulp. This is the second largest paper mill in Canada. The system of operating the different machines separately by electric motors is adopted in this mill, which is one of the most modern construction. The first pulp was turned out on Thanksgiving day, and paper will be made before the end of the month.

Louis Miller, the Scottish lumber operator, is about to acquire extensive timber holdings in Nova Scotia. He has secured options on a number of valuable areas, chiefly owned by the Dominion Lumber Company, of which W. D. Beardmore, of Toronto, is president. The property is situated at St. Margaret's Bay, on the west coast of Halifax, and comprises eight thousand acres of spruce and hemlock, with stores, buildings, and a mill at Ingraham Docks. Mr. Beardmore purchased the property from Young Bros., of Portland,

two years ago for \$200,000. The present purchase price has not been made public. Mr. Miller operates extensively in Scotland and Norway, and was the chief owner of the properties acquired last spring by the Newfoundland Timber Estates Company, of which Henry M. Whitney, of Boston, is president. Other purchases will also likely be made in Nova Scotia and New Brunswick by Mr. Miller.

A Dominion charter has been granted to the Societe Generale du Canada, with a capital of \$1,000,000 and headquarters at Montreal. It is to carry on a business in minerals and pulp. The incorporators are Francois Lefebvre, Ville, France; Henri Bordonneau, Paris, France; Judge Joseph A. Ouimet, Montreal; Hon. Adelard Turgeon, Quebec; William Wainright, Montreal; William E. Blauhart, Montreal.

La Societe de Produits Chimiques, of Labelle, Que., has obtained from the Provincial Government concessions of forest lands in that region, and this winter it will cut many thousands of cords of wood. It will also at once commence the erection, on the shores of Lake Labelle, of a building for the manufacture of methylic alcohol. This factory, together with instalment, will cost about \$60,000, and it is expected to begin operations in May next.

F. A. Summerville, of Watertown, N. Y., who represents twelve large pulp mills in Northern New York State, is said to have made the statement in Montreal recently that he had just closed a contract for 60,000 cords of pulp wood with one man. Ten thousand cords are to be unloaded at Cape Vincent, to be shipped to Watertown and its vicinity. Watertown district is a large buyer of Canadian pulpwood, and appears to be loading up with it just now. High prices are being offered from that quarter, one dealer in Canada being offered \$10.50 for wood delivered. It is apparent that more wood is going from Quebec to the mills in the Eastern States than ever before. It is computed that these mills obtain about 50% of their raw material supply from this side.—The Paper Mill.

Holyoke, the large paper making town of Massachusetts is short of water for power for its mills, several of which have now to run by steam at increased expense.

The Grand River Pulp & Paper Co., whose timber limits are in Labrador, has fixed its headquarters at Gillisport, 20 miles from the mouth of Grand River, Labrador, where a sawmill of a capacity of 150,000 ft. a day is being built.

The *Moniteur d'Anvers* says: "The Belgo-Canadian Pulp Company is passing through a severe crisis. The pulp for making newspaper, which we predicted some time ago should continually advance, has been steadily falling in a year by 35 per cent., and the Scandinavian mills have decided to restrict their output in a year by about 25 per cent. The mill has only produced 65 to 80 tons daily, instead of a calculated output of 100 tons. The cost of production has been found considerably higher than estimated in the prospectus. To these causes of loss have come accessory circumstances—accident to the temporary railway, blocking of the warehouses in Quebec, strike among dockers, forest fire, financial crisis [!] in Canada. The industrial difficulties of the company have been aggravated by insufficiency of capital. The shareholders were called to an extraordinary general meeting on Aug. 25th, at which the manager, M. de Laveleye, estimated the loss on operations during the six months, October, 1902, to May, 1903, to be 1,250,000 francs. In the opinion of the board the best plan to adopt would be the alteration of the pulp mill at Shawinigan to a paper mill, capable of a daily production of 25 tons news, in addition to the 75 to 80 tons mechanical pulp which the mill should continue to produce. In order to raise the necessary capital, say 625,000 francs, the board proposed to establish a subsidiary company (*une société fermière*), which should construct the new mill and have a mortgage on the old one. After the information given to the meeting, at least one-half of the capital was secured; the shareholders shall have the preference for subscribing."

In reply to an enquirer from Germany we may say that the Blanche River Pulp & Paper Co. was wound up before it had reached the point of manufacturing.

The John F. Bridges Tug Boat Co., of Georgetown, N.B., and the C. B. Parker Co., of Cole's Island, N.B., are among the new companies incorporated, and both have the power given them to deal in timber and wood products generally.

The Procter-Van Horne syndicate have definitely abandoned the idea of building a pulp mill at Grand Falls, N.B., and have leased the water power for 30 years to the Electro Manganese Co., whose headquarters are at Shawinigan Falls, Que.

A meeting of bondholders of the Sissiboo Pulp and Paper Company, Limited, was held last month, at Montreal, to consider an interim report of the liquidator, and what action should be taken to protect the bondholders. The meeting was adjourned without any decision.

The Rainy Lake Pulp and Paper Co. has plans now about completed for their proposed saw and pulp mills, to which reference was made in the last number of the Pulp and Paper Magazine, and a meeting of the directors will be held in Toronto about December 1st, to inspect them and make arrangements for building.

PERSONAL.

Mr. Williamson, of the China Clay Company, Manchester, returned to England this month via New York.

C. T. Craig, of Craig, Henderson & Co., Ltd., London, who was one of the delegates to the congress of Chambers of Commerce in Montreal, has sailed for home after a tour of the paper and pulp mills of Canada and the Western States.

E. B. Eddy, of the Eddy paper mills, Hull, Quebec, is making a trip to the Pacific coast. He was entertained by Tees & Persse, the western agents for his factories, while in Winnipeg. It is

four years since Mr. Eddy's last trip west.

Dr. W. K. Hatt, son of the late George Hatt, of Fredericton, N.B., has been appointed director of the lumber testing station recently instituted by the United States Bureau of Forestry at Purdue University, Lafayette, Ind. This is one of the stations established to investigate the mechanical properties of the commercial timbers of the United States.

SCANDINAVIAN PAPER IN BRITAIN.

Elsewhere will be found figures regarding the pulp and paper imports of Great Britain from countries with which Canada may compete in the future if not in the present. The following figures from the World's Paper Trade Review show the details of Scandinavian exports to Britain in the last five years:

SWEDEN.

The total receipts from Sweden were as under:

	Cwts.	£
1902	1,122,425	730,236
1901	1,045,695	696,152
1900	966,896	632,571
1899	746,471	498,499
1898	609,070	421,494

The above is classified as follows:

Unprinted.

	Cwts.	£
1902	989,583	671,853
1901	933,012	642,876
1900	838,945	570,406
1899	644,867	446,066
1898	540,586	387,762

Printed or Coated.

	Cwts.	£
1902	51	109
1901	548	697
1900	34	211
1899	296	275
1898	169	358

Wood Pulp Boards.

	Cwts.	£
1902	103,122	44,579
1901	79,084	37,091
1900	97,136	48,759
1899	86,366	43,264
1898	58,550	28,307

Strawboard or. Millboard.

	Cwts.	£
1902	29,669	13,695
1901	33,050	15,488
1900	30,781	13,195
1899	14,940	8,894
1898	9,765	5,067

NORWAY.

The total exports from Norway to Great Britain during the five years were as under:

	Cwts.	£
1902	917,441	612,571
1910	909,443	648,057
1900	879,755	638,580
1899	762,966	569,168
1898	622,414	448,750

These were classified as below:

Unprinted.

	Cwts.	£
1902	880,565	595,857
1901	909,443	648,057
1900	860,124	629,503
1899	741,437	559,097
1898	622,414	448,750

Wood Pulp Boards.

	Cwts.	£
1902	30,448	13,879
1901	22,507	10,011
1900	17,635	8,184
1899	17,792	8,215
1898	23,256	10,587

Strawboard and Millboard.

	Cwts.	£
1902	6,428	2,835
1901	2,328	1,133
1900	1,996	893
1899	3,737	1,856
1898	1,534	810



SCANDINAVIAN PULP AGENCY IN ENGLAND.

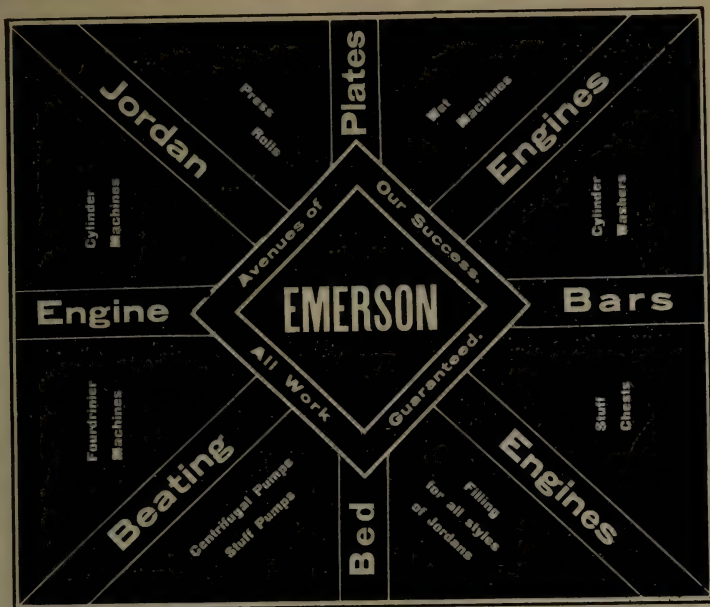
Affarsvarlden reports as follows: "On the 8th July last a proposal of by-laws for a Swedish Wood Pulp Manufactory Association was agreed upon; the purpose of this association being to co-operate with a similar union in Norway in order to arrange about common sales of the mechanical pulp from both countries. At the same meeting a temporary council was elected, which was charged to discuss the grounds for

a future co-operation between the new association and the Norwegian owners of wood pulp mills or an eventual combination of these.' During these discussions the Norwegians expressed strong doubts regarding the suitability of giving the proposed general agent so much power; they wished instead that there should be only one common office for sales, with agents in different places abroad. As for the place of this office, Christiania was considered most appropriate, as the production of mechanical pulp is 50 per cent. larger in Norway than in Sweden, and especially as the cellulose makers of Sweden and Norway agreed upon having a common office for sales in Gothenburg, because the Swedish production of this article is larger than the Norwegian. On account of this, the Swedish temporary council and the Norwegian committee appointed for the same purpose worked out a new proposal for organising the association, and this proposal was accepted at a meeting of the Norwegian owners of wood pulp mills on the 11th of September, when the Swedish temporary council was present. In order to arrange as well as possible about the distribution between the makers of the quantities sold, it has been suggested that the office should have one Swedish and one Norwegian principal, each of whom is to have the productions of his own country in his special charge. At the meeting there were present representatives for a production of about 200,000 tons moist weight. Makers of about 150,000 tons moist weight have expressed their sympathy with the co-operation to members of the Swedish temporary council, while it is to be supposed that at least 350,000 tons will be gathered, and thus the minimum amount stipulated in the constitution will be reached."



P. F. Dooley, formerly superintendent of the Canada Paper Co.'s Mills, at Windsor Mills, Q., during the past two years in similar positions in the New England States, is to take charge of the Muncie, Ind., Paper and Pulp Mills.

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For Draining Drying Cylinders, Steam Coils and Steam Pipes.

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This trap works in any position and equally well with high or low pressure steam. It will separate the water of condensation from the steam, discharge the water and hold the steam.

The Geipel Trap will discharge a continuous stream of water the full bore of pipe connections. One of these should be placed at every point on a steam line where it is possible for water to collect, and the steam thus kept dry.

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THE MARKETS.

Reports from London state that a much better tone prevails in chemical pulp, and better terms are expected for future deliveries. In actual sales sulphite, unbleached, is quoted at £7 to £7 2s. 6d. per ton, and about five shillings more for superior qualities; bleached, £10 15s. to £11 10s., and £13 to £14 10s. for extra quality. Soda fibre is quoted at £6 10s. to £7 2s. 6d. for common and 5s. to 10s. for superior. The market for mechanical is quiet, but the outlook in this line is also a little better. Canadian spruce, dry, runs from £3 10s. to £3 15s.; poplar, £5 10s. to £5 15s. In the Manchester market chemical pulps are about the same, but in mechanical that market quotes Canadian spruce, dry, at £3 10s. to £4.

The Farmand reports as follows on the Scandinavian pulp trade: "The market for mechanical wood pulp has taken a decidedly firmer turn, and sales have been effected at Kr. 28 per ton f.o.b. for prompt, which would not have been practicable a fortnight ago above Kr. 26. There are many enquiries for delivery over next year, but buyers' bids, although better than the prompt value, do not tempt mill owners. The promoters of the proposed mechanical pulp combine are confident of success; this may perhaps have had some influence on the attitude of buyers, but the news from Canada has probably had more to do with the changed tone. Chemical pulp is rather unsettled, and current prices do not yield a satisfactory return on the

capital, if sufficient amounts are to be written off for depreciation on plant." The paper then goes on to refer sarcastically to Canadian competition: "It was reported last year with a great flourish of trumpets that important English paper mills had made very cheap contracts for very large quantities of Canadian pulp for five years ahead. It would be interesting to know whether the Sault Ste. Marie mill or the Acadia mill were among the sellers."

Reports from London show that the chemical market is quiet, partly caused by the light demand from the textile trade. Prices are steady, but sales somewhat slow in heavy chemicals, bleaching powder and caustic soda. There is a falling off in the imports of brimstone; but china clay is brisk, and producers are taking contracts for next year's delivery. Prices are for the following chemicals free on board cars at works: Bleaching powder, 35 to 37 per cent., £3 10s. to £3 12s. 6d.; caustic soda, 60 per cent. £8 12s. 6d., for 70 per cent. £9 12s. 6d., for 77 per cent. £10 10s.; soda ash, 48 per cent., £5 5s.; alum, loose, £4 10s. to £5; sulphate of alumina, £4 5s.; sulphur, recovered, £4 15s. to £5, and roll brimstone, £6 15s.; Sicilian, £5; mineral white, seconds, 17s.; pottery, £1 6s.; superfine, £1 9s. China clay, f.o.b. Cornwall, in bulk, 11s 6d. to £1 6s.; in bags, 4s. extra.

The outlook for Canadian pulp is rather better, an improvement being looked for in the British market, while the demand from the United States is good. A New York correspondent reports

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Easy Bleaching,
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that business is steady with the Western mills, while Canadian pulp in the East is in good demand. This is partly accounted for by excessive rains and crush of freight on United States railways making delivery of the domestic article, a matter of concern for the moment. Mechanical pulp is quoted in New York at \$14, f.o.b., at pulp mill. Bleached sulphite, domestic, \$2.35 to \$2.75; do. do., foreign, \$3 to \$3.75; domestic soda fibre, 2½¢.



Geo. H. Waring, Jr., will succeed his father as mechanical superintendent of the Cushing Sulphite Fibre Co., of St. John, having resigned the chief engineering of the Standard Oil Co.'s steamer Hudson to take his new post. As mentioned last issue, Geo. H. Waring, Sr., resigned to take charge of the Allan Foundry Co. in Carleton. On the occasion of his leaving the pulp mills he was presented with a gold watch and chain from his fellow employees.

PAPER STOCK MARKET.

The Canadian mills are busy, without exception, and the demand for paper stock continues brisk. The following are wholesale dealers' selling prices, delivered:

Domestic white rags	\$2.00 to \$2.10	per 100
Blues and thirds	1.10 to 1.20	" "
Dark cottons	75 to 90	" "
Roofing paper stock	45 to 50	" "
Waste papers	35 to 45	" "
Hard white shavings	2.00 to 2.10	" "
Soft white shavings	1.00 to 1.25	" "
Book stock	75 to 90	" "
Manilla rope	2.00 to 2.20	" "
Mixed bagging	55 to 65	" "
Sisal and jute string	75 to 1.00	" "
Flax tow	1.10 to 1.25	" "



--Owing to the great landslide which swept three farms into the River Lieure, near Buckingham, this month, the McLaren Co.'s pulp mill and lumber mill had to shut down, the water being so muddy.

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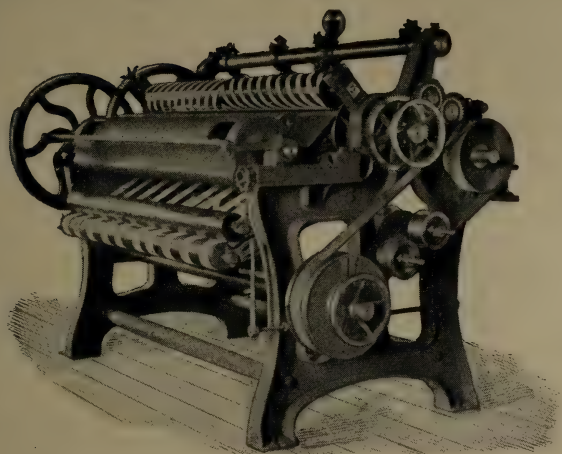
CHRISTIANIA (Norway) ..	Kirkegaden No. 20.
GOTHENBURG (Sweden) ..	Lilla Kyrkogatan No. 20.
MANCHESTER	Guardian Buildings (opposite Exchange).
LONDON	77a Queen Victoria Street, E.C.
PARIS	Rue de Londres No. 29.
ANGOULEME (France) ..	43 Rue Louis Desbrandes.
LYONS	54, Cours Gambetta.
MILAN	3 Via Gius. Verdi.
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NEW YORK	99 Nassau Street.

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 Number and size of tubes 64, 3½"
 Dome 30" x 30"
 Pressure allowed for next ten years, 100 lbs. per sq. in.
BOILER NUMBER FIVE 16' x 66"
 Number and size of tubes 108, 3½"
 Dome 36" x 36"
 Pressure allowed for next ten years, 100 lbs. p. r sq. in.
BOILER NUMBER NINE 14' x 60"
 Number and size of tubes 64, 3½"
 Dome 36" x 36"
 Pressure allowed for next ten years, 100 lbs. per sq. in.

BOILER NUMBER EIGHTEEN, Twin
 shell, lower shell 14' x 60"
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 Thickness of plates ⅝"
 Double riveted.
 Pressure allowed, 80 lbs. per square inch.

BOILER NUMBER NINETEEN—
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 Number and size of tubes 66, 4"
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DR. C. WURSTER, 29 Abbey Road, St. John's Wood, LONDON, N. W.

—The attempt recently made by United States capitalists to get control of the china clay mines of England, and corner the world's market in that material, appears to have failed. The Paper Maker is informed by a Truro firm that the Americans found the difficulties too numerous, and the Royal Cornwall Gazette, published at Truro, says: "With regard to this report, we are informed locally that the negotiations on the part of the American syndicate for the amalgamation by means

of American capital of all the clay mines in the West have been in progress for twelve months or more, and that, so far from having met with any success, the largest firm in Devonshire has flatly refused to have anything whatever to do with the proposal. It is believed that the large firms in Cornwall also will not hear of the suggested combine, but the movement may meet with some success among the smaller owners. In any case, no such monopoly as is outlined by the Daily Mail is possible."

Action has been entered at Osgoode Hall, Toronto, against Peter Ryan, auctioneer of Government timber berths. The suit is for \$5,835, which H. L. M. Weller claims as his share of a commission for the sale of limits at one time owned by General Alger, of the Laurentides Pulp Co. Mr. Weller acquired his interest from E. J. Lynn, of Detroit.

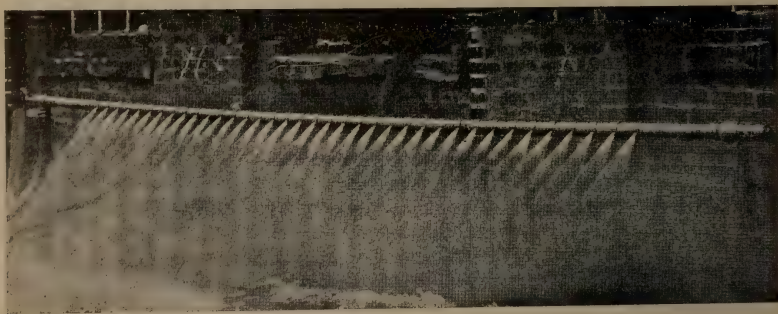
—Biggar-Samuel, Limited, Toronto and Montreal, have issued the first number of a publication, entitled "The Pulp and Paper Magazine of Canada." It contains 52 pages of regular magazine size. Articles in the first number include the following: "Fibres for Paper Making," by Earnshaw Bradley, C.E., Toronto; "Canada and Her Forests," by George Johnson, Dominion Statistician, Ottawa; "The Pulp Mill at the Soo" (with folding plate), by E. G. N. Cape, C.E., Montreal; "The British Paper Industry and its Relation to Canadian Trade," "Anglo-Canadian Pulp Trade," and other interesting contributions.—Canada Lumberman.

—The Hosiery Trade Journal is rather scornful about the paper stocking. "Our old friend, the paper stocking, is to the front again in the columns of the non-technical press. In the latest report, which comes from the Continent, it is admitted that little is known of the process of manufacture, but, it is added: 'Let no one assume that these stockings, because they are made of paper, will only last a few days, for they will really last almost as long as ordinary stockings, the reason, it is pointed out, is because the paper of which they are made is, during the process of manufacture, transformed into a substance closely resembling wool, and it is then woven and otherwise treated as ordinary wool.' We have not seen the new "wool," but if it so closely resembles the genuine article as to affect the present high prices of that commodity, its advent will be welcomed in many quarters, even though this latest example of Continental enterprise threatens further inroads on the British hosiery industry."

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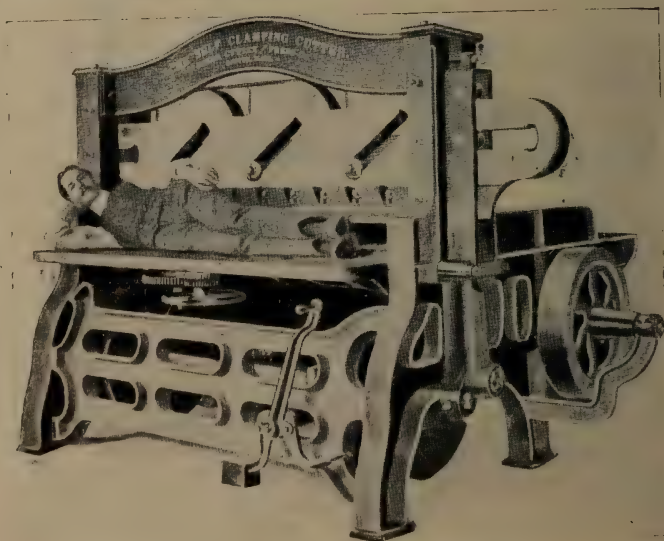
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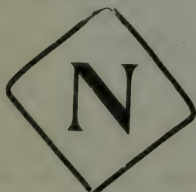
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PULP AND PAPER

MAGAZINE

MONTREAL AND TORONTO

Vol. 1.

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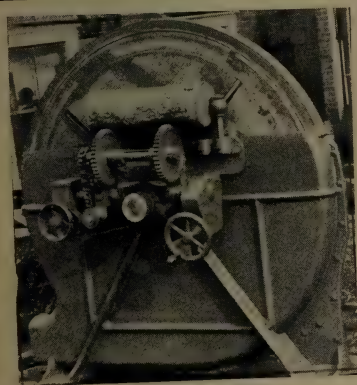
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VOL. 1.—NO. 7.

TORONTO, NOVEMBER, 1903.

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{ SINGLE C. PY 10c.

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Changes of advertisements should be in the publishers' hands not later than the 1st of the month, and, where proofs are required, four days earlier. Cuts should be sent to the Toronto office, by mail, not by express.

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18 Court St., TORONTO. Fraser Bldg., MONTREAL.

THE BRITISH PAPER M.

We have given a good deal of space in this issue to the report of the British Paper Makers' Association's discussion on the preferential tariff, because of its importance to the future of Canada's pulp industry. A large majority of the members of this body voted in favor of Mr. Chamberlain's policy, though many of them have been old free traders. We have already given statistics of the British paper trade, which go to show that in the most important markets of the world British exports of paper and paper products have relatively declined, while British imports of foreign-made papers have alarmingly increased. In other words, the British maker not only

fails to keep pace with his rivals abroad, but does not hold his own even at home. The paper trade is no isolated or exceptional case, but the same story is told in so many other lines of manufacture that the unfavorable reaction of one industry upon another is at last awaking the British people to the fact that the whole fabric of industrial supremacy is in danger. The case of the paper manufacturers is thus put by the World's Paper Trade Review of London:

1888, one of the best of those years during which the paper-making industry of the United Kingdom waged—but only to be worsted in the end—a hard fight for supremacy with the foreign papermaker, the value of the imports, after deducting re-exports, was £1,674,000, and that of the exports of British paper was almost exactly the same. Once again, therefore, both sides started fair, but this time the result was that the Britisher was hopelessly beaten in the race. Five years passed by, and then (in 1893) the foreigner was ahead to an enormous extent, as he sent us paper to the net value of £2,240,000, and only took to the value of £1,333,000 from us. Here we have already a difference on the wrong side of £900,000, all accumulated

within the short period of five years. By 1895, even if we exclude more than half a million pounds' worth of boards, the foreign total had risen to £2,300,000, the British one being £1,288,000, or more than a million pounds behind! Last year, the value of the importations of foreign unprinted paper only into the United Kingdom exceeded three millions, and only about 3 1-3 per cent. of it was re-exported, so that nearly 97 per cent. of the total quantity received was consumed at home. The British export total for 1902 was £1,671,000. On the face of it, this shows only a difference of about £1,270,000 in favor of the foreign article, but then we must add to the three millions just mentioned more than half a million for printed paper, and close upon a million for boards. Thus we have an aggregate total value of about four and a half millions of pounds as that of the foreign paper, etc., consumed in this country in 1902."

On the pulp side of the question we shall probably know more of trade opinion after the present meeting of the British Wood Pulp Association; but we may dismiss as childish cackle the statement of a letter writer in the London Speaker, who has no reason to doubt that if a prohibitive tariff is put on foreign pulp, a Canadian pulp combine would be formed and the British printing trade would be ruined. In the first place no one ever proposed a "prohibitive tariff" on foreign pulp, and in the second place the conditions of the Canadian pulp trade in its relation to that of Scandinavia and the United States are such that a combine is practically impossible, so far as the export branch is concerned. And if such a combine were possible, it could be

quickly and effectually broken by any syndicate of British paper mills which chose to buy timber limits in Canada and start its own pulp mills.



In an interview with a representative of the Pulp and Paper Magazine, J. R. Walker, of the firm of J. R. Walker & Co., Montreal, made a suggestion which appears to us to be the most valuable ever put forward for carrying out a forest policy and for the regulation of power developments on our rivers. This is that a commission be appointed, with powers partly administrative and partly judicial, to deal with these questions, which are becoming each year more important to the commonwealth as affecting our climate, as well as the most valuable of our material resources. Other valuable suggestions are made on timber questions in a report by Hon. G. W. Stephens, of Montreal, referred to elsewhere in this issue, and these we hope to discuss in detail in another issue.



Out of about 1,200 paper mills in the United States, less than 200 make their own pulp. The other 1,000 and more are buyers of pulp. Scientists and forestry experts in the United States have for some years been warning the State and Federal Governments of the destructive character of the operations of pulpwood operators, and it will not be long before the pulp and paper industry of that country is face to face with grave changes. Already, as shown elsewhere, experts are looking for new woods, such as balsam, cotton wood, pine, etc., but each wood produces its own peculiar quality of paper, and most of them are known to be inferior to spruce. Our public men in Canada and those in au-

authority in our Provincial Governments should not forget that upon the present pulpwood policy depends the success of what Nature has marked out as one of the greatest industries of Canada in the very near future. The old proverb warns us that it is better to be wise by others' follies than by our own. The indiscriminate and unscientific destruction of forests by our own pulp men is bad enough, but in the face of what has already happened in the States, the handing over of our choice timber lands to spoliation by foreigners, who in one act lay waste the forest and strangle a Canadian industry in its birth, is like sacrificing one's children to Moloch.



IMPERIAL PAPER MILLS.

The Imperial Paper Mills of Canada, Limited, started up last month. As already stated, the equipment of these mills is of the most modern character, and the working of the machinery so far has been highly satisfactory. The first car load of paper was shipped to the United States in the last week of October. These mills are situated at Sturgeon Falls, on the Sturgeon River, which flows into Lake Nipissing. The property, which includes not only the water privilege, yielding an enormous horse power, but thirty-six square miles of land, timbered with fine spruce sufficient to last for hundreds of years, was acquired by the present corporation from the Sturgeon Falls Pulp Co., an English syndicate. The principal shareholders of the Imperial Paper Mills of Canada are also English, but the corporation has a Canadian charter.

The concessions owned by this company comprise the whole water shed of the Sturgeon River, a territory of 3,400 square miles, and it and its tributaries furnish easy channels for driving logs. In the present installation the company is using about 4,000 h.p., but

it proposes to make further developments up to 12,000 horse power, and build pulp and paper mills of corresponding size.

In giving an account of the starting of the machinery the Sturgeon Falls Advertiser says: "The thorough methods of the management in demanding careful work were amply vindicated in the successful test of the machinery. Every water wheel responded as the gates opened one by one, and the huge generator and motors worked like a charm. A thorough test was made of the electrical equipment and pulp and paper machinery. Under the management of C. W. Rantoul, an expert of many years' standing in the paper and pulp industry, and the mechanical supervision of Thos. McCormick, who seems to be part and parcel of the machinery, so closely is he in touch with every detail of equipment, the Sturgeon Falls plant bids fair to be one of the most complete and best managed industries in the paper trade."

This plant has been under construction since March, 1902, the architect being George F. Hardy, of New York City. Construction work on the dam and the buildings was done by Peter Lyall & Sons, of Montreal.

The ground wood room contains nine Port Henry grinders, manufactured by the Jenckes Machine Co., Sherbrooke, Quebec. This room has a capacity of fifty tons of ground wood pulp per day. The grinders are driven by McCormick turbines, manufactured by the S. Morgan Smith Company, of York, Pa. The paper mill proper is operated by electric motors, these and the generators being furnished by the Westinghouse Electric and Manufacturing Company. The only steam used in this plant is for the purpose of drying the paper and heating the mills, and is supplied from three Babcock & Wilcox tubular boilers, set with extension furnaces for burning the refuse from the saw and barking mill. The machines are two Fourdriniers, 120 in. wide, and are capable of producing twenty-five tons per day each, or fifty tons per day in all. The mill is composed of steel and concrete construction and brick walls, and is ventilated by fans furnished by B.



Imperial Paper Mills, East Elevation, Showing Ground Wood Mill in Foreground.



Imperial Paper Mills, Sturgeon Falls, Ont., Showing Forebay and Head Gate Dam.

F. Perkins & Sons, Holyoke. It is lighted throughout with electricity.

The beater-room has four 1,500 lbs. beaters and five wet machines for running out surplus pulp. In the ordinary process of handling the stock, however, the ground wood stock is pumped direct from the wood mill to the beaters.

The mill will have its own machine shop in a separate building, which is now under construction.

The product of the paper mill is news, which will be shipped to various foreign ports and to cities in the Dominion.

A. B. Craig, the president of the company, is of the well known firm of John Craig & Sons, 8 Well St., Cripplegate, London, England. I. B. Hosford, who is vice-president, is a well known paper manufacturer of New York City, former partner in the Glen Mills, of Berlin, New Hampshire, also of the Haverhill Paper Co., of Haverhill, Mass. For seven years he was a member of the Executive Council of the International Paper Co., 30 Broad St., New York, and later vice-president of the Union Bag and Paper Co., No. 1 Broadway, New York. C. W. Rantoul, Jr., the treasurer and general manager, was for many years manager of sales and manufacture for the Ticonderoga Pulp and Paper Co., New York City. He was secretary and treasurer of the American Paper and Pulp Association, New York City, 1889 to 1901, and was expert special agent on paper and pulp mills for the United States Government in the compilation of the twelfth census, 1900 to 1902. From 1888 to 1893 he was with the Fairchild Paper Co., of Boston and East Pepperell, Mass. From 1894 to 1896 with Train, Smith & Co., of Boston, Mass. From 1896 to 1902 the Ticonderoga Pulp and Paper Co.



THE SALE OF TIMBER BERTHS.

As announced elsewhere, an important auction sale of timber berths in the Crown Lands of Ontario will be held at the Crown Lands Department, Parlia-

ment Buildings, Toronto, at 1 p.m., Dec. 9th.

The following are the chief conditions of sale: Each berth to be adjudged to the person bidding the highest amount of bonus therefor per square mile. The berths sold to be subject to the "Crown Timber Regulations," except in so far as the said regulations may be inconsistent with any conditions herein specified, and to such Acts or Orders-in-Council as now exist or may hereafter be passed affecting timber or territory under Timber License from the Crown. The Department reserves the right to one bid on each berth. No reduction from area sold to be allowed for water. The dues on the red and white pine timber on the berths in the Nipissing and Algoma Districts shall not be less than \$2 per thousand feet board measure on saw logs, and on square, waney or board timber not less than \$50 per thousand feet cubic measure. The dues on the timber sold in the Rainy River District shall be as follows: Red and white pine \$2 per thousand feet board measure for saw logs, and \$50 per thousand feet cubic measure for square, waney or board timber, and for jackpine, tamarac, cedar, spruce and poplar \$2 per thousand feet board measure when taken out in the round, and five cents per tie for tamarac, cedar, and jackpine if hewn into ties, and on spruce and poplar cordwood eighty cents per cord. The purchasers of berths in the Nipissing and Algoma Districts shall be entitled to take the red and white pine only, but they shall be entitled to cut such other timber as may be necessary in order to make roads or for other purposes requisite in the removal of the pine timber. The purchasers of the berths in the Rainy River District shall be entitled to take all kinds of pine timber, and the spruce, cedar, tamarac, and poplar, except as to Berths G. 19, G. 21, G. 23, G. 29 and G. 38, on which red and white pine only can be cut. Licenses for berths awarded at sale to be issued in due course after payment in full of bonus and annual ground rent at the rate of \$5 per square mile. All timber cut on these limits shall be

subject to the "manufacturing conditions," i.e., shall be manufactured in Canada. The limits shall be sold subject to the condition that no license to cut and remove the timber disposed of at this sale shall issue after the expiration of fifteen years from the 30th of April now next, and all timber remaining on the limits after the expiration of fifteen years from the 30th April now next shall be the property of the Crown.

Purchases to the amount of \$1,000 or under to be paid in cash on day of sale. Purchases over \$1,000 and not exceeding \$5,000, one-half of bonus to be paid on day of sale, and a note or notes given for the remaining half of bonus payable in three months at a bank in the City of Toronto, with interest at six per cent. Purchases over \$5,000 and not exceeding \$10,000, one-third of bonus to be paid on day of sale, and notes to be given for the remaining two-thirds of bonus, payable in three and six months at a bank in the City of Toronto, with interest at six per cent. Purchases over \$10,000, one-fourth of bonus to be paid in cash on day of sale, and notes to be given for the remaining three-fourths of bonus, payable in three, six and nine months at a bank in the City of Toronto, with interest at six per cent. Ground rent for current season to be paid with cash payment of bonus. Cash payments must be made on the day of sale by marked cheque or bank draft payable to the Treasurer of the Province.



FAIRBANKS CO.'S NEW BRANCH HOUSE.

The Fairbanks Co., of Montreal, have taken the premises at 41 Front Street West, Toronto, next to H. S. Howland, Sons & Co., and can now make shipments from that point. H. J. Fuller, general manager of the Fairbanks Company of Canada, has appointed C. J. Brittain as local manager, M. C. Mullarkey, of the Montreal house, will have charge of the accounting room, and D. T. White, of headquarters staff, will have charge of the floor sales. J. S. Sanson

will continue to cover the territory of the northern part of Ontario, and T. G. Hubbard the western portion. The staff will be further increased shortly. The valve department will handle a full line of Fairbanks' asbestos disc valves, Pratt & Cady gate and check valves, asbestos packed cocks, W. I. pipe, valves and fittings, as well as a line of steam specialties manufactured by the American Steam Gauge and Valve Co., of Boston, Mass., for whom they are sole Canadian agents. In the transmission department they will handle a full line of shafting, hangers, belting, pulleys and supplies. In the machine tool department they will make a specialty of the Niles Bement-Pond Co. and the Pratt & Whitney Co.'s product, for whom they are sole Canadian agents. Besides this they will have a line of the American Tool Works Co.'s tools, Yankee twist drill grinders, Greenard arbor presses, and all kinds of machine shop supplies. The gas and gasoline engine department will be in a position to supply Fairbanks' gas and gasoline engines, both vertical and horizontal types, from 1 to 100-h.p. The asbestos department will confine itself to the product of the H. W. Johns-Manville Co., of New York, for whom they are sales agents for Canada. The Fairbanks Co. have had a large business in Toronto and Western Ontario, but the necessarily longer deliveries from Montreal have shown the advantages of keeping a stock at a more central point for distribution in Ontario.



SAULT PULP MILL STARTED AGAIN.

The pulp mill of the Lake Superior Consolidated Co. started again on November 11th. There was some delay experienced on account of repairs and the difficulty of getting experienced help, many of those formerly employed having left the Sault to seek employment elsewhere after operations were suspended. Hon. R. Dandurand is in England endeavoring to make arrangements for all the works to resume. F. H. Clergue is also there on the same errand.

In connection with the resuming of the pulp mills it will be interesting to recall their genesis. After the development of the water power had been effected there was not the expected rush of applications from manufacturers, and the syndicate was forced to consider how it would utilize the power. From an examination of the forests it was found that spruce was the only wood that could be brought to the works at a reasonable cost. It was accordingly decided to begin the manufacture of pulp, and two hundred and fifty thousand dollars was set aside for the construction of a mill. This was for works with an output of twenty tons of pulp a day, but it was soon found that it would cost as much to run a mill that size as one much more extensive—except for the labor charges and increased cost of raw materials—and the works were accordingly enlarged until they had a capacity of one hundred cords of wood per day. The next step was the endeavor to obtain a machine by which the water could be extracted from the liquid pulp, so that over half the freight charges on the product of the mills might be saved. This liquid pulp contains from 50 to 55 per cent. of water, and on account of the great cost of transportation it would be impossible to ship it to the European markets. In addition to this, a great deal of the resinous matter remains in the fibre, and when exposed to a changeable climate becomes decomposed, and gives the green stain which is seen in pine boards that have not been properly seasoned. It was impossible to find a paper machine maker who would undertake to construct the required mill to produce dry pulp. Mr. Clergue himself finally designed the machine, and to build it found it necessary to construct a machine shop, and then decided that they should have a foundry. So that with the object of obtaining dry pulp one hundred and twenty-five thousand dollars more were expended in the erection of subsidiary works.

The next step in the evolution was a sulphite pulp mill. It was found that with a slight increase in the cost the ground

wood pulp, which sold at a very low price could be greatly enhanced in value by making it into chemical pulp. For this, sulphur was required, and a mine was purchased at Sudbury, for which \$100,000 was paid. Then the sulphite paper mill was built, with about the same capacity as the first.



GLASCO VS. TORONTO PAPER COMPANY.

In the new trial in this case the jury has given a verdict of \$8,000 for the plaintiff. Glasco had sued for \$20,000 damages for the loss of his right hand and portions of the fingers of the other, which were amputated in a paper cutter in the company's mill. The case was first heard before Justice Britton at the October Assizes of 1902, and a verdict of \$2,500 was given. An appeal was taken a couple of months ago, and the Court of Appeal ordered a new trial. The evidence was much the same as in the first case, except that the plaintiff introduced an eye-witness of the accident, Albert Hollister, and James Nelson, an experienced machinist from Montreal, who claimed that the machine was not in perfect running condition.

The following questions were submitted to the jury by His Lordship:

1. Ques.—Was injury to John Glasco from his own want of care? Ans.—No.
2. Ques.—If not, was injury owing to any defect in or about the machine at the time? Ans.—Yes. Ques.—And if so, state what was the defect? Ans.—A loose adjusting screw and weak spring.
3. Ques.—If defect existed, did any one in the employ of the company superior to John Glasco know of such defect before the injury, and if so who was the person superior to John Glasco? Ans.—The foreman.
4. Ques.—Was the company guilty of negligence in not providing and having a proper machine and plant for cutting paper, and if so, what was the negligence? Ans.—Company found to be negligent.
5. Ques.—Was John Glasco injured in

consequence of such neglect without blame on his part? Ans.—We find that he was, and without blame on his part.

6. Ques.—If Glasco is in your opinion entitled to recover, fix the damages? Ans.—\$8,000.

The company has declared its intention to appeal again.



PULP MILLS ON THE LAKE ST. JOHN.

The following is a list with capacity per annum of the mills on the line of the Quebec and Lake St. John Railway:

Metabetchouan Pulp Co., Metabetchouan; capacity, 15,000 tons pulp (under construction). Arch. Racine, president, Quebec; Jos. Ed. Caron, secretary-treasurer, Quebec.

Ouiatchouan Pulp Co., Ouiatchouan Falls; capacity, 15,000 tons pulp. Et. Paradis, president, Quebec; J. I. Lavery, secretary-treasurer, Quebec.

Jonquiere Pulp Co., Jonquiere; capacity, 3,000 tons pulp, 4,500 tons cardboard. Wm. Price, president, Quebec; F. W. Denison, superintendent, Jonquiere.

Peribonca Pulp Co., Peribonca; capacity, 9,000 tons pulp. Hon. A. Robitaille, president, Quebec; P. A. Potvin, secretary-treasurer, Quebec.

Chicoutimi Pulp Co., Chicoutimi; capacity, 40,000 tons pulp. Hon. N. Garneau, president, Quebec; J. E. A. Dubuc, managing director, Chicoutimi.

Sissons Pulp Mill, Bourg Louis; capacity, 1,500 tons pulp. Geo. Sissons, proprietor, Bourg Louis.

St. Raymond Co., Limited, St. Raymond; capacity, 6,000 tons pulp. Jno. Macfarlane, president, Montreal; F. W. Evans, vice-president and secretary-treasurer, Montreal.



PRICES OF MECHANICAL PULP IN GREAT BRITAIN.

Statistics compiled by Becker & Co., the well known pulp merchants, of London, England, show the following to be the average prices paid by British paper

makers for mechanical wood pulp in the years named:

	Per Dry. Long Ton.
1894	£4-12
1895	4- 4
1896	3-18
1897	4-10
1898	4
1899	3-16
1900	6
1901	4-14
1902	4- 4

The high prices of 1900 were due to the Boer War, when freights were abnormally high, owing to the diversion of so many steamers into Government service in South Africa.



Geo. Trueman is to give a series of lectures on forestry in Mount Allison University at Sackville, N.B.

An exhibit of Canadian pulpwood and manufactured pulp will be one of the features of the Canadian section of the St. Louis Fair.

—The Victoria Times says: Vancouver Island timber limits are attracting the attention of outside capitalists. At the present time there are a number of small parties of experts prospecting at different points on the island for the purpose of ascertaining what parts are thickly timbered, and also noting the character and quality of the timber. They have been sent out by the International Lumber Company, which has property scattered all over the continent, and owns mills at both Seattle and Everett. It is stated that it is the intention of the International Lumber Company to secure 50,000 acres of timber lands on Vancouver Island. What the intention of the company is after having secured the timber can only be conjectured. Sawmills will likely be established at different points. In view of the restrictions against the export of timber from British Columbia the logs cannot be taken to the mills on the Sound. The only thing to be done is to establish mills. This means the employment of a large number of men.

WOOD PULP PAPER.

(FROM "PRACTICAL PAPER MAKING," BY
GEO. CLAPPERTON, PENICUIK, ENG.)

Comparatively few papermakers in this country prepare their own wood pulp, most of the supply being obtained from the Swedish and Norwegian pulp mills. A knowledge of the principles on which the different processes for obtaining the cellulose are based and the effect of the treatment on the pulp produced is, however, indispensable to the papermaker, that he may be able to determine which pulp is most suited to his particular requirements.

Wood, like jute, belongs to the class of ligno-celluloses, and is composed of about two parts of cellulose, intimately bound up with one part of non-cellulose, or lignin. The processes employed to break up this combination may be classed under three heads. First, the alkali process, which takes in the methods depending on the use of caustic soda. Second, the acid process, under which may be arranged the various methods based on the reducing action of sulphurous acid in the gaseous or liquid state.

CHEMICAL FIBRE PROCESSES.

Midway between these two classes stand those of Dahl, Blitz and Cross, the former of which employs a solution of sodium compounds containing a large percentage of sulphate of soda, and is known as the sulphate process. The process patented by Cross, mainly with the idea of rendering the use of lead-lined boilers unnecessary, while depending on the action of neutral solutions of the bisulphites, provides for the use of alkalis. The boiling in Blitz's process is conducted by a solution of sodium sulphide, to which is added a very small proportion of vanadate of ammonia.

Whatever may be the process employed to produce the cellulose, the wood must first undergo a preliminary mechanical treatment in order that the pulp may be of a uniform character. The trees are first sawn into small logs, which are then stripped of the bark and cut

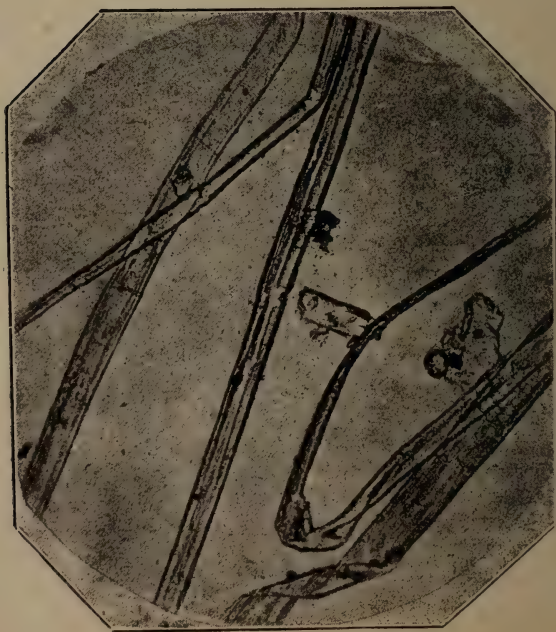
into boards by passing through a slitting machine. The knots are next bored or cut out, and the boards broken into small chips by a breaking machine. The chips are then passed under heavy rollers, which bruise them in such a way as to allow the boiling solution to thoroughly soak them, and finally passed along revolving screens, through which the dirt and dust, set free by the crushing, escape, while the clean chips are carried on to the boiler or store-house as they may be wanted. The caustic soda process of Watt and Burgess may be taken as the typical alkali method of isolating the wood cellulose. In this process the wood, having been subjected to such a treatment as that described, is digested in a large boiler with a strong solution of caustic soda, under a pressure of about ninety pounds, for ten or twelve hours. It is the necessity for employing such high temperatures and pressures that constitutes the serious drawback to the alkali processes, as under the conditions of boiling the strong caustic solution acts on the cellulose, impairing the strength and reducing the yield. The reason why such conditions are necessary is that the soluble acid bodies resolved by the caustic become so oxidized and condensed that they counteract and weaken the reducing action of the soda, and in order to equalize their resistance higher temperatures and pressures have to be employed.

It is with a view to prevent the oxidation of these acid bodies that the soluble bisulphide of sodium is used by Dahl. Notwithstanding the presence of this reducing agent, the pressure employed is high. It is in doing away with these counter influences that the chief advantages of the acid processes lie. By using a solution of a bisulphite, such as lime or magnesia, the acid bodies are removed by entering into combination with the base, at the same time setting free the sulphurous acid, which acts on the unresolved wood until all the non-cellulose substances have been removed.

In Ekman's process the wood is digested in a large, lead-lined, jacketed boiler, fitted so as to revolve when de-



Mechanical Pulp, Magnified.



Chemical Pulp, Magnified.

sired. The solution used is prepared by passing sulphurous acid gas, produced from burning sulphur in a stream of air, up through a tower in which the magnesia, with which it combines to form the bisulphite, is loosely spread out. A stream of water, running down through the tower, meets the sulphurous fumes in their upward course and carries them into solution.

Care is taken that the sulphurous acid and magnesia are kept at the proportions necessary to produce a double sulphite. The strength of the bisulphite solution thus obtained is about one and a half per cent. of magnesia and four and a half per cent. of sulphurous acid. When the steam is turned on, the pressure in the inner chamber increases with greater rapidity than in the outer owing to the tension of the sulphurous vapor; but it is said that the best results are obtained by keeping the difference between the two pressures under thirty pounds.

As the pressure increases, the blow-off cock is opened that the gases may escape, and thus avoid over-heating and consequent discoloring of the wood. In about seven or eight hours the pressure reaches eighty-five to ninety pounds, and after about three hours' boiling at that pressure the action is stopped, and the wood, after washing and draining, is ready to be bleached.

In the Partington process the sulphurous gas is led into tanks containing milk of lime and a bisulphite of lime solution at once obtained. By this method the boiling can be completed in from sixteen to eighteen hours, though in some cases, when increased pressure is employed, the time required is a little less.

While the principle underlying the various sulphite processes is the same in each case, they are divided into two classes, owing to the duration, or rather the differences which exist in the duration of boiling. In what are termed the "quick" processes the boiling is completed in from twelve to sixteen hours. To accomplish the complete separation of the cellulose and the non-cellulose substances in that time a strong acid solu-

tion at a high temperature must be employed.

In the Mitscherlich process the solution used is much weaker, and contains a greater proportion of base. The result is that the boiling must be extended from forty to sixty hours, and the pressure is also much lower. By this latter treatment it is claimed that a larger percentage yield is obtained than by the quick methods of boiling. It is, however, difficult to see where this increase can come from unless the incrusting substances are imperfectly removed, and so add to the weight of pulp produced. If this is the case it will soon make itself known by the increased amount of bleach necessary to give a good color.

Wood and jute show a close analogy in chemical composition, and the difficulty experienced in bleaching wood, from which all the incrusting matter has not been removed by the boiling, is due to the formation of a yellow chlorine compound similar to that produced when chlorine acts on jute. This yellow body must first be bleached before the cellulose is brought to a good white color, and the amount of chlorine necessary to do this acts very injuriously on the fibres. This weakening is also noticeable in highly bleached sulphite pulps; and, though the degree of whiteness obtained by using a large amount of bleach makes such pulps suitable for the better qualities of paper, it is obtained at the sacrifice of much of the original strength and elasticity of the fibres.

Though Dahl's process is generally known by the term "sulphate," the solution employed to digest the wood contains other sodium compounds. It is principally composed of sodium sulphate, sodium sulphide and sodium hydrate, and the strength of the recovered solution is maintained by the addition of fresh quantities of sodium sulphate. This process is said to possess a slight advantage over the caustic alkali methods in point of economy; but it is the general opinion among paper-makers that the pulp produced is inferior in strength and less free from incrusting substances than that ob-

tained from the sulphite processes. Owing to the presence of these incrusting matters sulphate wood is, however, more suitable for the making of papers which are wanted opaque.

In a Scotch mill, making a specialty of its wood pulp papers, the wood is treated with a bisulphite of lime solution, prepared by passing the sulphurous fumes into a tower containing the limestone, through which a stream of water is kept running. With the solution thus obtained a charge of eight tons of wood is boiled in a large rotary boiler, under a pressure of fifty-seven pounds, for seven hours, when the pressure is lowered for a few minutes by opening the blow-off valve and allowing the volatile compounds to escape, and again increased, this time to eighty pounds. This pressure is maintained for twelve hours.

The boiled wood, after washing, is emptied into a large pit beneath the boiler, from which, after draining, it is lifted into boxes, pressed, and taken to the breaker, or washer, as it may more correctly be termed. After washing, by means of a drum, the wood pulp is emptied into a chest, from which it is pumped to flat-bottomed strainers similar to those used in connection with the "presse-pâte." The strainer pulp is next run into the potcher in which the bleaching is conducted.

After the wood has received a preliminary bleaching, the washing-drum is let down, and the chlorine compounds, formed by the action of the bleach on the imperfectly removed incrusting matters, washed out. After this washing is completed the amount of bleach necessary to bring to a good color is run in, and when the color is up the wood is emptied into the draining-chests, where it lies until wanted.

The pulp produced by this process is strong, and comes to a good color when bleached. It has, moreover, one distinct advantage over many of the wood pulps in the market, in that it comes to a soft, greasy condition with comparatively little milling, with the result that the papers made from it, especially the lighter weights, possess a strong yet silky feel.

MECHANICAL WOOD PULP.

A large portion of the wood used in paper-making has been subjected to no chemical treatment, and is known as "mechanical wood," to distinguish it from the pulps produced by the various chemical processes. The mechanical wood is obtained by pressing large blocks of wood against revolving grindstones, which tear the fibres from the mass. The ground wood is washed from the stones by means of a continuous flow of water, and carried through a series of screens, in which the dirt and fine dust are separated from the fibres.

Though the blocks of wood are placed so that the fibres will be torn laterally, the grinding action of the stone has the effect of making them very short, and this, together with the incrusting matter with which they are surrounded, deprives them of their felting power to a large extent.

In order to get as long a fibre as possible the wood is sometimes steamed for ten or twelve hours previous to grinding, that the fibres may yield more readily to the tearing action of the stone, and thus be torn at a greater length. At best the pulp thus produced is possessed of little felting power, and is not suitable for any but inferior grades of paper, such as news or low quality printings.

Apart from the poor felting properties of the fibres, the lignin contained in the wood is acted on by air and light if exposed for any length of time. It is this oxidizing and decomposing action which is the cause of the discoloration of paper containing even a small proportion of mechanical wood pulp.

Notwithstanding these serious defects, mechanical wood is largely used as a filling material owing to its low price and opacity. Because of the latter property it is much used to counteract the transparency of papers made from sulphite wood. As much as 70 per cent. is often used in the manufacture of news, and even with no other fibre than 30 per cent. of sulphate or sulphite wood a good news is produced.

BRITISH PAPER MAKERS AND PREFERENTIAL TARIFFS.

As noted in last issue a meeting of the Paper Makers' Association of Great Britain was held in London last month, to discuss the question of preferential tariffs, and the metric system.

After passing a resolution calling for the compulsory adoption of the metric system and subscribing money to support the work of the Decimal Association, the tariff question was taken up.

Joseph Dixon, a member of the Association, who had recently been in Canada and the States, opened the discussion by moving the following resolution: That, (1) in the opinion of this meeting it is desirable that a tariff duty be put on manufactures of all kinds, including paper, from protective countries, and that (2) any measure that will tend to closer union between the Mother Country and the colonies is worthy of support."

The subject was one that should not be very lightly touched upon, because it was going to upset the whole business relations between themselves and other countries that had existed for sixty years. Before passing such a resolution as he proposed, or before such action was taken as Mr. Chamberlain was advocating so ably from many platforms, they ought as business men to give the matter the very greatest consideration they were capable of. The struggle that had now begun would possibly have been relegated to the distant future but for the powerful advocacy of Mr. Chamberlain. But thanks to his enlightenment, the matter had been brought within the range of practical politics. The extraordinary educational influence of the press was a matter they might just touch upon here. The enormous flood of articles, letters, and speeches on the proposed change in the fiscal policy, that had been placed before them by the press during the last three months, would have posted them up in most of the general arguments that could be brought for and against

it. He now proposed to touch the matter as it affected their business of the paper trade. Thanks to their Association, some figures had been placed before them that to him very graphically showed the position as it affected them. The first page of the pamphlet showed the total weight and value of paper exported from the United Kingdom to foreign countries and British possessions, for three periods at intervals of ten years—1882, 1892, and 1902. The growth in weight had been from 29,248 tons in 1882, and 43,683 tons in 1892, to 50,383 tons in 1902. During ten years, 1892 to 1902, the value of exports of paper had gone up from £1,431,204 to £1,478,686, and he maintained the business had practically not increased at all. If that was the condition in which the British paper trade ought to exist, he contended it was in a very poor state. If they looked at the imports of foreign paper into this country, a very different picture was portrayed. The increase in value of the imports of foreign paper to this country during twenty years was 256 per cent.—80 per cent. during the last ten years. In weight, the imports had gone up 430 per cent. On the last page of the pamphlet were some interesting figures on the home trade. They had increased their output only 28 per cent., and 57 mills of average type produced an average output of 80 tons per week for each mill. With regard to America and Canada, there was a well-rooted belief, in the minds of manufacturers over there, that their respective Governments were primarily elected for the express purpose of enabling the people to carry on business only in such a manner as to best shield them from attacks by competitors outside their borders. Surely they could unite and with one voice call out that their trade was being ruined by the competition of their rivals. The mills he visited in America were mostly news mills, and from the experience he gained he did not think they knew everything in the world about paper. With regard to one

mill he went into, if anyone asked him to devise a scheme for driving a paper machine on the crudest and weakest method, and one the most calculated to consume the greatest amount of fuel, he could not devise a better scheme than was working in that mill. He pointed this out to show that they had something to learn even in America. He was convinced that they had very little advantage over us in the manufacture of news paper. Perhaps the fibres might be somewhat cheaper. In many mills they paid seven dollars a cord, which was 28s. for a ton of wet pulp, before they manufactured at all. The cost of utensils, wages and the cost of living were all much higher than with us. Some people were under the impression that power was so cheap in America that we could not possibly compete with them. That was absolutely contrary to fact. In the mills he went into they were paying more for driving power than it cost us. He did not think it was possible for them to make paper any cheaper than he did himself in this country. How was it they sent their paper over here and competed with us? The International Paper Co. and other large trusts told him it paid them exceedingly well when they could only dispose of 90 per cent. of their paper in their own country, and sent the other ten per cent. over here for what they could get for it. But it tended to ruin us. They did not mind making so much less on that ten per cent., because they laid no store on the mill's wear and tear. But we suffered in this country in consequence. He asked what would be the probable effect of the imposition of a ten per cent. duty or tariff of any kind. Why, the employer would be first affected, and that by a great expansion of his business. Practically they did not want to increase the price, but they wanted the protection of our markets. With regard to the employees, they would probably get as much benefit as anyone, because wages would be bound to increase, as there would be such a demand for labor. He had no hesita-

tion in saying this, and he would even promise that as soon as a ten per cent. tariff was imposed he would be delighted to raise all his wages ten per cent. He had no doubt that every man in that room would have to raise his wages ten per cent., and it would be the finest thing they had ever done. If the price of news was raised $2\frac{1}{2}$ per cent., would that be a calamity to this country? It would be a great blessing to the people engaged in the manufactures of the country. He had been in a good many mills in England and in some in America, and he thought it was the duty of every man engaged in the papermaking business to go to America. The man who had not visited an American mill he considered did not know his business yet; they were doing themselves an injustice if they did not go. Some of them were running machines now that were made over 30 or 40 years ago. They had no right to do that. They ought to have scrapped them years ago. But they had no chance of doing so. In America he found an installation of ten or twelve of the finest machines in the world. They had not had a chance of having these at home, because the home market was ruined by the system of dumping. It was the duty of all to support Mr. Chamberlain in the alterations in our fiscal policy he wished to make, because it would be for their own benefit and the benefit of their workpeople. In concluding, Mr. Dixon said he defied anyone to say that the adoption of such a policy would do otherwise than enhance the position of the employer and the comforts of his workpeople.

Mr. Garnett then addressed the meeting. He took it the Papermakers' Association had no politics, and that it knew no party. He took it that it was the wish of that meeting to impartially and judicially consider the evidence that should be put before it, and when in the possession of that evidence, without any selfish motives they should give their decision upon the proposal which had been put before them by his friend Mr. Dixon. He had seen the President

of the Canadian Society in London, and had shown him a copy of Mr. Dixon's proposal. He said he did not take any exception to it, all he asked them to do was to give them a preference. How much it might be they did not care. All they asked them to do was, as they termed it in Canada, to give them "the sunny side of the street." It was in that sense that he seconded the resolution that Mr. Dixon had proposed to them. He asked them to consider carefully the facts and figures that had been put before them. Mr. Dixon, owing to his late return from abroad, had not been able to obtain the facts that had been published within the last few days, and he would ask pardon if in some of his figures he were found to differ from him. He asked them to look at the general aspect of the fiscal problem. Their exports of manufactured articles to the protective countries of Europe and to the United States of America had fallen since the boom year of 1872 to the year 1892 from 166 to 74 millions, and during the same period their imports had risen from 63 to 149 millions. Now he would at once admit that if our own people were well and profitably employed at home they could not import too much of any article, and they could not import it at too low a price. But they had it on the authority of Sir Henry Campbell Bannerman, and he derived his information from General Booth, that there were twelve millions of the inhabitants of these isles living on the verge of starvation. He believed that to be an exaggeration. He had gone to considerable trouble to enquire what was the meaning of living on the verge of starvation. Probably most of them would understand that such people were not enjoying a living wage. But he had learned only within the last few days that the impression intended to be conveyed by the General of the Salvation Army was not that, but that they were living on every week's wages in turn, so that one week's idleness would bring them to a state of destitution. He did not say that made any dif-

ference in the distress of their workmen. His answer to this matter of the twelve million unemployed was that we ourselves had, by humanitarian restrictions upon labor, by the adoption of shorter hours, by the demand of higher wages, deliberately increased in this country the cost of production. It had been the fixed policy of this country to improve the condition of the working man in every possible direction. They had made him to-day, as it were, the West End workman of the world, and he was not in a position to compete with the sweated labor of the East End. Their opponent told them that though individuals might suffer by the importation of large quantities of foreign goods at a lower price than those produced in this country, the community in general benefited. Whether this be true or not, and he would endeavor to disprove it later on by facts and figures which would be absolutely known to them all, he wanted to point out to them that in this respect they stood alone in the world. No other manufacturing country in the world took the same view of these matters as they did. They could perhaps remember an old drawing in Punch, representing a jury which had been called on to deliver its verdict. Eleven had arrived at a decision, but the twelfth, an Irishman, was depicted, in Keene's admirable way, shaking his fist as he cried, "Eleven more obstinate men I never saw in all my life." This appeared to him to be the position in which this country found itself at the present moment. They were saying to the rest of the world, "Eleven more obstinate men I never saw in all my life." The lawyers, financiers, and scions of various noble houses would have them believe that on this question they alone were right and all the rest of the world wrong. Looking at this question from a trade point of view, he asked them to consider whether at all times the importation of foreign paper had been advantageous to the community. It would be within their recollection and especially in that of his friend on

his left (Mr. Dixon) that some two or three years ago, in consequence of the over-production of American news, there was a very heavy importation from that country to this. Various of our ports on the West coast, and London, contained large quantities of this paper which had been sent over and had to be sold without delay. He had ascertained from a circular which he addressed to 13 news mills, excluding only those in the London district, that the effect of this upon their trade was as follows: Short time was worked in many, machinery was stopped in others, and in some instances the mills were altogether closed for a short period not exceeding three weeks. Others were more fortunately situated and continued to work, and put heavy quantities into stock which were later on sold at a very serious loss. As far as he had been able to ascertain, the price at which this paper was sold was about five per cent. below that of the British-made article. But assuming it to have been £1 per ton; then for every sovereign which went into the pocket of the newspaper proprietor there was a positive loss of wages to the workers in their mills of £2 5s. per ton, to which, of course, must be added the profits of the mill owner, of the carrier, and all the auxiliary trades. He had taken these figures from the statistics that were in the hands of everyone of them, and he believed them to be moderate. In his own case wages ran higher than that. Dismissing altogether the consideration of the loss incurred by the mill owner, the carrier and other trades, the point he wished to drive home was this: that while £2 5s. a ton came out of the pocket of the poorest class of the community, some 15s. or £1 a ton went into the pocket of the more or less wealthy newspaper proprietor, whilst the balance of that sum went, they might assume, into the pocket of the foreign working man, whose mills were kept employed whilst they were working short time. In this case they had an absolute loss to the community of at least 25s. a ton.

To put it in other words, the nation whilst effecting a saving of 15s. or 20s., made a loss of £4 or £5 a ton, of which nearly half was paid by the poorest class. That was the point he wished to emphasise. He thought the most pronounced Free Trader would admit at least that this was a highly unsatisfactory result; but the facts and figures could not be disputed, and everyone there could judge whether he had exaggerated the costs. There was no means of arriving at the exact quantities or any approximate estimate of the wages actually lost, but this displacement of British labor lasted several months, and, as they would observe from the statistics, there was an average increase in the importation of unprinted paper in 1900 and 1901, as compared with 1899, of nearly 30,000 tons, and coincident with this there was a decreased consumption in 1901 over 1900, of wood pulp, amounting to 40,000 tons, and these were the figures supplied by the Association. They would, he thought, probably be well within the mark if they assumed this quantity was not less than 20,000 tons, and that the loss in wages alone to their work-people amounted to £45,000 or £50,000. The imports of 1903, up to the end of September, averaged 30,000 tons per month for the whole year. It would probably exceed 35,000 tons for the whole year. That was six times as great as our exports, and more than six times as large as they were in 1882. He thought, as Mr. Dixon had said, here was a matter for the very gravest consideration. Of our exports, roughly speaking, about 70 per cent. went to our Colonies and India, and a small proportion went to neutral countries. Whilst our shipments to the protective countries of Europe and America were practically non-existent, we were buying from them to the amount of 350,000 tons a year. Was it wise that they should continue the advocacy of "duty free" with the disastrous results to their work-people which he had endeavored to show? Was it not desirable that they should, in the inter-

ests of all engaged in their industry, place a duty upon foreign imports? The amount was not stated, but for the sake of argument let them take it at ten per cent. He wanted to get at close quarters with the political economist. He was bound to admit that in the main he must accept his deductions without reserve. He must admit that any resolution they passed there could have no permanent effect if it violated the principles of political economy. But assuming an import duty of ten per cent., it raised the home price of their entire production by $7\frac{1}{2}$ per cent. He did not think it would do so, but assuming for the sake of argument that it did, if that led to an increased production of 20 per cent. at home, he maintained that the economic balance would remain absolutely undisturbed. For every 100 tons now produced, they would then be producing 120 tons, and at £1 a ton their economic debit would stand at £120. On the credit side they would have to place an increased production of 20 tons, and at £6 a ton, which was the difference between the value of the raw material and the finished article, this would restore the balance. That was the point upon which he based his argument. The community in general would not suffer by it if the increased quantity was produced in this country. The conditions under which their trade was carried on had changed very considerably during the last few years. He would call attention very briefly to the question of preferential treatment. Who were the men who were asking them to accord them preferential treatment? They were far and away their best customers already, and must be by far their largest in the future. They were already offered a preferential trade in the case of Canada, and all they asked them to do was to give them something in return. He seconded the resolution.

Mr. T. Y. Nuttall congratulated the Association on the large and influential attendance at the meeting, and compared it with the lack of support that was given to the same matter when it

came before Sir John Evans in 1886. Great progress had been made since then. He did not propose, in what he would say, travelling beyond what he might call the simple a.b.c. of the economics of the question they were then to thrash out. He would endeavor to place a few considerations before the meeting that would help them to arrive at the truth. He cared nothing about where the victory would lie, if the question had the careful consideration of the members of the paper trade. The question was narrowed down by confining it to the paper trade. They all had their own books, and that was the only standard they need apply or look at, so far as their trade was concerned. He had tried as far as he honestly could to see how matters stood with regard to the prosperity of the paper trade of the United Kingdom. He had had a few statistics printed, because they showed what proportion the home trade bore to the foreign trade of the country. They were told that things were in a state of stagnation, and that the general impression was that they had been losing money all the time. But that was not the condition of the British paper trade. British paper-makers might have a lot of drawbacks, but he had had his eye to the main chance. The British paper-making trade had not been by any means a stagnant trade. His memory went back to 1873, and there was competition even in those days. The trade then had its gloomy prophets, who said that if they did not do something they would go to the dogs. Sir John Evans was one of the men who said that the remedy in the paper trade was to protect themselves from the unfair competition of the foreigner. From 1882 to 1892 they found in the statistics that the British paper trade had increased 50 per cent. He submitted that a trade which had increased 50 per cent. in ten years was not a dying trade, and could not by any stretch of imagination be called a decaying trade. From 1892 to 1902 the same thing was seen. Without laboring that point he submitted that no trade

could be called in a state of stagnation or a decaying industry under those circumstances. If further proof was wanted, they had the fact that the dividends paid by Limited Companies engaged in this industry had not on the whole been unsatisfactory. The shares showed an average return of $7\frac{1}{2}$ per cent., and 21 out of 30 securities were at a premium. He submitted that that, at all events, did not entitle any gentleman to come up and say the paper trade was in a state of stagnation or was a languishing industry up to the year 1902. It was a libel on paper-makers to say that they had not succeeded in their industry. Up to that date it had been a paying industry and had been successfully carried on by those who had devoted themselves to it. During the period, 1882 to 1902, the price of paper had fallen 46 per cent. The loss that meant to the paper trade of the United Kingdom had to come out of the profits that had been made before, and no industry that was not firmly established and doing a profitable business could possibly have stood that. It was due to the change in the raw material of the paper-maker. He submitted this was a point they had to look in the face that afternoon. It was no good making wild statements about what was going to happen. The centre of gravity in the paper trade had changed altogether in thirty years. The fibres they did not possess were possessed in large quantities by those against whom they were competing. That was what they had to consider before supporting this resolution. No more serious revolution ever came to an industry than came to the paper trade in having to produce paper from fibres they were not in possession of. An industry that had found means to secure that raw material and competed successfully with those who had it at their doors was a trade to be proud of. They had bought it, turned it into paper, and though the competition of the foreigner was serious, yet up to 1902 they had beaten him in the fact that he had lost money. So that, up to 1902, at

any rate, they had no reason to regret the policy of Free Trade, and had no reason to be ashamed of the part they had played in competition, fierce as it had been, nor had they reason to be ashamed of the way the paper-maker had come out of the contest up to 1902. That justified the policy of Free Trade to his mind. He was not so simple as to think that because that policy had been successful hitherto it would be prosperous ever afterwards. Before parting with a principle that had carried them so long and so far successfully, they ought to very carefully indeed look into the system that was proposed to be placed in its stead. He contended the policy of Free Trade was fully justified by the results during the last thirty years as regarded the British paper trade, and having regard to the unequal competitive war which it had had to wage with the foreigner. Since 1902 their most serious competitor had been Norway. The figures with regard to Norway were very remarkable. That country had increased its exportations to this country at a phenomenal rate. They might take it as a typical case, because if they saw what was happening and was going to happen in Norway, they could take it for granted that the conditions that met the Norwegian case would meet their own case as against Protection. In 1882 they sent us 500 tons of paper; in 1892 they sent 12,000 tons, and in another ten years—in 1902—they sent 61,500 tons. That was a marvellous record. No country in the world could claim such a record as that, and if they met that case, he submitted that they could meet any case that could be presented. He had a letter from the chairman of the Norwegian Paper-makers' Association in which he said, speaking of the result accruing to the Norwegian papermaker for his pains during 30 years—whilst they in England had been making money all the time—he said the profits had not been large in the Norwegian paper mills, they must on the contrary be said to have been very discouraging. He gave a long list

of mills, and eight of them, he said, had had to succumb, and all of them had had to be recapitalized. He was prepared to admit that if anywhere a case could be made for Protection it was on the fact that they were dependent almost entirely now for their raw material against the men with whom they had to compete. By putting a duty on paper it would stimulate the importation of wood pulp into this country and prevent the turning of that much into paper on the other side, so they would be doubly blessed. That was a case the expert in the paper trade would make if Mr. Chamberlain got his mandate. But he had not got it yet. On the other side of the question, however, this resolution not only said they wanted a duty on paper, but the object of the movers of the resolution was to put one on manufactured articles generally. Mr. Chamberlain proposed to put a duty on 90 millions, but he was happy to see that fibre was not included in that. When it came to a fight between the paper trade and the press, they were face to face with the most powerful organization that the country possessed, and not only that, but actually the men who could appeal to the country in a way that no private individual could. Concluding, Mr. Nuttall pointed out that paper was the first thing the great masses of the world economise on. The present scheme of protection would tend to limit the spending power of the wage earners of the country, and assuming this, then Protection would do no good whatever. If the consumption fell to a great extent, the inter-competition amongst British paper-makers would be sufficient to put their trade in a disastrous condition. Honestly as a paper-maker, he believed that if the general principle of Protection was adopted, the consumption of paper would drop to such an extent as would more than outweigh any advantages they might get.

Mr. Lloyd said Mr. Chamberlain proposed to put an average ten per cent. duty on manufactured goods coming from abroad. He thought the paper

trade represented $4\frac{1}{2}$ millions. What they wanted to know was how Mr. Chamberlain was going to arrive at this ten per cent., and then they should consider how under the system the paper trade would be affected. He claimed after a careful examination that there would be no benefit to speak of. Mr. Dixon and Mr. Garnett had drawn a glowing picture of high prices and so on. They were glad to have these things in the paper trade. But on Mr. Chamberlain's own proposition he had tested the matter, and claimed that they would be worse off. If Mr. Chamberlain put a ten per cent. duty on all manufactured goods coming into this country, he claimed to stop 92 millions worth of foreign manufactures coming in, but he did not mention that he was going to stop 92 millions worth of British manufactures going out. They could not get away from that. There was no possible answer to it. Such a course would seriously affect our shipping industry. Reference had been made to the dumping question. Would any one suggest that a duty of ten per cent. would keep out dumping? Cheap water power was a great advantage, but he claimed that by this imposition of duties they would really be putting themselves in a worse position to compete with those who had ample water power. If duties were put on all round they knew they would have to pay more for machinery and other items. The cost of production would be bound to be increased, and the export trade of this country would be bound to diminish.

Mr. Duerden, after quoting a letter he had received from a friend in America, in which the writer stated that he considered under the present conditions the employer and employed in this country, on the whole, had not a fair chance, said this had set him thinking of what advantages they derived from the system of Free Trade over Protective countries, and he had come to the conclusion that if they could not convert other countries to be Free Traders and so put them all on more equal terms in their

methods of exchange, they should do something through Protective methods so that they could work on equal lines. As it was at present, they were one nation against all the rest, including their Colonies. If they needed Protection, he said, adopt it. As far as paper-makers were concerned, he felt confident that if some duty was put on imported paper, it would benefit the employers and employed in the paper-making industry.

Mr. Reed considered it was undesirable that any such change should be made. He had received a document from Germany the previous day giving a list of 26 paper mills making printings and newspapers, and out of them only one had been paying a dividend during the last three or four years. Instead of interfering with their trade system, they should establish a free National education. We wanted an educational system second to none in the world, and they wanted to put their man in the front rank. They wanted an education of moral understanding of the people throughout the land. The workers and masters in America were a much more sober, plodding, persevering and active people. He believed we were suffering under the prosperity of years gone by when money was made so easily that there had been a great increase in the luxury of the country, and the productive power of the country had diminished. A Canadian had told him that he was surprised to see the waste of time and money and physical strength consequent on the drinking habits of this country.

Mr. Lewis Evans said he had had committed to him by a prominent hand-made paper maker a letter he wished to communicate to the meeting. In it he said: "The chief point upon which a criticism of the proposals would turn is, perhaps, how do they affect the paper trade? Should it not rather be, are we as a nation as prosperous as we ought to be? It is conclusively proved that the countries from whom we buy most

take least of our goods. Every shilling spent with a man who buys our products increases the man's purchasing power for our advantage. Every purchase from one who refuses to buy from us because he makes the articles we sell increases such a one's power of competition to our manifest disadvantage. That is the case for preferential tariffs. Every paper-maker knows the meaning of contra accounts. Mr. Chamberlain proposes to apply that system to our over-sea trade. It seems unlikely that any man who understands trade will fail to give him the fullest support." He did not read that as what he should say himself. He thought to some extent the discussion that day was premature. What they actually at the moment have before the country was not Mr. Chamberlain's, but Mr. Balfour's proposals. The latter committed himself strictly to the question of threatened retaliation. Mr. Chamberlain went much further. Generally speaking, he gave limited support to the resolution before the meeting, but at the same time he would much rather see it withdrawn and the matter considered piecemeal, going forward a step at a time rather than trying to advance by leaps and bounds.

The Chairman said he had been connected with the paper trade upwards of 63 years, and he could look back on the "good old times" when they were making a fair profit on one's money. The extent that it was necessary to protect themselves from the trade of foreign countries was, he thought, a question they did not contemplate 40 years ago. At the present time it required their most earnest consideration. He thought until they knew something more definite of Mr. Chamberlain's proposals, they had better withhold from making any distinct pronouncement. He would like to see a more or less corresponding duty to that levied in foreign countries placed on the paper of that country coming here. It would produce a good effect at all events.

The first clause of the resolution was carried by 33 to 18 votes, and the second clause was carried unanimously.



THE MANUFACTURE OF "NEWS."

(From the Paper-Maker, London.)

In the manufacture of "news" the number of raw materials is few and the changes are less complicated, and for this reason we have selected this class of paper for consideration. The application of the suggestions made to other and better class papers is merely a matter of extension and adaptation. The raw materials for the newspaper are: Mechanical pulp, sulphite pulp, china clay, alum, rosin size, broke, recovered back-water residues, water. These are the materials for common "news." We neglect, for this example, the bleaching process, in order to simplify the illustration, and also the coloring matter, which is so infinitesimal as to make no difference. It may be noted that we have put down recovered back-water residues; but in a typical case, we should assume that such residues were being worked up in the beaters. The influence of such residues on the composition and quality of the paper produced must not be neglected. The inclusion of water may seem unnecessary; but we shall show that the changes due to the water used in the manufacture of paper exercise some considerable influence on the final results.

Now, in preparing a schedule of these materials for the production of a given weight of paper, we must set out the weight of each, and show to what extent the various operations alter the weight, and how much of that weight we may expect to find in the finished paper, and thus trace any losses to the proper source.

When the yields obtained in practice are somewhat below the average, blame is often attached to the wrong party. The machineman blames the beaterman; the latter insinuates loss through drains and the like, and so the game proceeds. However, a proper understanding of all

the conditions likely to raise or lower the yield is the best and most logical conclusion to arrive at.

The next step in the study of this problem is to set out an imaginary furnish for a given quantity of paper. As a typical case, we may take the following quantities as representing the average results of a week's run in the mill, based on an amount of about 100 tons of dry pulp.

Material.	Tons.	cwt.	qrs.	lbs.
Mechanical pulp	70	0	0	0
Sulphite pulp	30	0	0	0
China clay	9	0	0	0
Alum cake	1	15	0	0
Rosin	0	12	0	0
Alkali	0	3	0	0
Total	III	IO	0	0

This is the list of the bare materials actually used from the stock. The use of the broke and residues will be discussed in the proper place. Now, as to the mechanical pulp, which we may consider first. If this is supplied in 2-cwt. bales, for example, the bales are taken as equal to 1 cwt. dry pulp. But this weight includes the weight of the staves of wood, or other wrapping which is round the bale.

The average tare of the staves and wire fastened round a 2-cwt. bale, assuming, for the sake of example, that staves are used, would be 1½ lb. to 10 lb. per bale. For 70 tons of mechanical pulp we have 1,400 bales, upon which the tare for staves is $1,400 \times 1$ lb., that is, 1,400 lb., or over half a ton. Then, as to the question of moisture. When the deficit is a serious one the beaterman is usually given instructions to add a certain proportion of an extra bale to each beater to make up for it; but in cases where the deficit is not so very large it is ignored. Let us imagine that an accurate test for moisture has been made. It shows that a bale weighing 2 cwt., with the staves, tests 49.30 per cent. of air-dry pulp. In practice, this shortage is neglected; that is, so far as the actual manufacture is concerned, although the paper-maker would not neglect to make a claim on the pulp

maker for excess moisture. Thus, the bale is regarded as being up to the mark, and noted as containing 112 lb. of air-dry pulp.

In reality, we have the following state of things:

Gross weight of the bale..... 224 lb.
Less tare of staves..... 1 lb.

—
223 lb.

223.0 lb. at 49.30 per cent. gives 110 lb. of air-dry pulp. Hence, on 1,400 bales we have deductions to make as follows:

Cwts. qrs. lbs.

For the tare of staves.... 12 2 0

For slight deficit due to
small excess water..... 12 2 0

— — —
Total deductions ... 25 0 0

Thus, to begin with, we have an allowance to make, in the matter of the mechanical pulp, of 25 cwt., and the conditions set out are not at all unusual. Hence, we have to place on the credit side of the balance-sheet losses due to certain explainable causes for the mechanical pulp of 25 cwt. It must be noticed that when the pulp comes packed up in 4-cwt. bales the loss due to tare of wrapping is not quite so great. On a 4-cwt. bale the weight of the staves and wire would be from 1½ lb. to 2 lb., but rarely the latter, except with heavy wood packing. An allowance of 1½ lb. per bale would be sufficient, as a rule; but, in any case, this is easily ascertained by actual testing.

Dealing with the sulphite wood precisely in the same manner as the mechanical, we have to determine the exact conditions of the pulp. The allowance for wrapping is generally small. If for 30 tons we have 200 bales of dry pulp, and assume that the hessian cover and the wire together average 1 lb., the deduction for wrapping comes to 200 lb. Then, as to the question of moisture. Sometimes the pulp will show a deficit, and sometimes an excess of air-dry contents. Let us imagine the latter case, in order to show how to allow for this condition of things. A careful examination of the 200 bales gives a gross weight of

Tons.	cwt.	qrs.	lb.
30	2	2	20

while the test for air-dry contents gives 100.50 per cent. This latter will occur when the pulp has been over-dried at the pulp mill, so that on arrival at the paper mill an allowance of the usual 10 per cent. for atmospheric moisture will make the pulp appear over 100 per cent. air-dry weight. Of course, this is not very usual; but we give this instance as having occurred.

Hence, the exact state of this 200 bales is as follows:

	Tons.	cwt.	qrs.	lb.
Gross weight received	30	2	2	20
Deduct for wrappers	0	1	3	4
	—	—	—	—
	30	0	3	16

Had the pulp been just in an air-dry condition this weight would be the correct amount of pulp to be booked up; but as it has proved to be somewhat over-dried, a correction must be made so as to make the figures similar to the air-dry condition of the mechanical pulp.

Thus we get:

Tons.	cwt.	qrs.	lb.
30	0	3	16

At 100.5 per cent. is:

Tons.	cwt.	qrs.	lb.
30	3	3	16

The true amount of normal sulphite pulp in the 200 bales, taken for mill purposes at 3 cwt. each, is, therefore, not 30 tons, but somewhat more, as shown. Had the test given an excess of moisture, say, 99.0 per cent. of air-dry pulp only, then naturally the loss has to be determined along the same lines.

The next item on the schedule is the china clay. This loading generally contains 20 to 22 per cent. of water. Of this, 10 per cent. is chemically combined water, which can only be removed by strong heating over a gas-burner. The other 12 per cent. is natural atmospheric moisture, which can be driven off, in the same way as the natural moisture in wood pulp, by exposing the clay to the heat of a water oven. Since the allow-

ance for air moisture in pulps is only 10 per cent., we shall simplify matters by considering that the clay will only contain 10 per cent. as well, and, as a matter of fact, while the clay when delivered at the mill often shows 12 per cent., or more, yet clay exposed to a normal dry atmosphere reaches a dry condition in which the moisture is 10 per cent. Hence, if we weigh out the 9 tons of clay, and make a test for moisture, this must be taken into consideration. We may have, for example, the following result from the chemist's testing:

	Tons.	cwt.	qrs.	lb.
China clay	9	0	0	0
Air-dry clay (containing 10 per cent. moisture).....				97.00 p.c.
Excess of moisture.....				3.00 p.c.
				<hr/> 100.00

Under these circumstances, the actual available weight of clay is 97 per cent. of 9 tons, or

Tons.	cwt.	qrs.	lbs.
8	14	2	12

which means a deduction of 5 cwt. 1 qr. 16 lb. for the clay. This has to be placed on the credit side of the balance-sheet.

Alum Cake.—The composition of alum cake varies somewhat, so that no hard-and-fast rule can be laid down. We give the results of a case in our experience, and this will serve as an illustration of the points to be observed:

Analysis of the Alum Cake.

Insoluble matter (silica, etc.)....	30.40
Sulphate of alumina.....	43.00
Combined water	18.06
Water driven off at 100 degs. C...	8.00
	<hr/> 100.00

Of this material the insoluble residue would find its way into the finished paper. As to the other components of the alum, we must consider these in relation to the whole question of sizing. When a solution of alum is added to the rosin size made from the rosin and alkali, a precipitate is produced. This precipitate adheres to the fibres and presumably goes into the paper. We do not propose to discuss the actual chemical

changes in this re-action, but merely to indicate the losses in weight.

The weight of precipitate produced on adding a solution of alum to rosin size is easily determined by simple chemical methods. With the rosin size made by boiling 4 cwt. of rosin in 1 cwt. of alkali, and precipitating with alum, we get the following results:

	Cwt.	qrs.	lb.
Rosin used as per schedule	12	0	0
Alkali used	3	0	0
Weight of alum cake required to precipitate (about) ..	11	0	0
Approximate weight of precipitate obtained by the re-action	22	0	0

This last weight includes the proportion of the insoluble matter originally present in the alum used for the precipitation. The losses thus due to the sizing operations amount to 4 cwt. in this direction. According to the schedule, the quantity of alum cake added to the furnish was 35 cwt. A considerable excess of alum cake is nearly always employed for this class of paper, though probably not to the extent shown. Some of the alum is necessary to counteract the hardness of any fresh water added to the beaters, or to neutralize the hardness of the fresh water used on the paper machine. Fresh water is seldom added to the beating engines, as there is generally enough back water for this purpose. Of the extra alum cake added in the example it is doubtful if more than half is actually found as added weight to the paper; 30 per cent. of it is the insoluble silica, and possibly 20 per cent. more is obtained as alumina, or is found in the form of sulphates of lime in the paper.

(Concluded in next issue.)



PAPER MAKING IN TONKIN.

Among the native industries carried on in Tonkin, showing considerable ingenuity combined with great patience, is that of paper-making. This manufacture

is conducted by some villages on the shores of the Grand Lac, about three miles from Hanoi, and in all probability it has been the occupation and support of these dwellers by the lake for some centuries. Certain it is that the processes have been handed down to the villagers from generation to generation. Primitive as are their appliances, the manufacture requires both industry and skill. The village I visited is situated on the south-east corner of the lake, and on one side of it is a shallow canal, which communicates with the citadel moat. Embosomed in trees, chiefly areca palms, the village is picturesque, and forms a pleasant little excursion from Hanoi.

The first intimation of the industry by which the inhabitants live is afforded by glimpses of men in the shallow water of the lake, busy washing with great vigor round baskets of some material, which nearer inspection shows to be some sort of pulp. The village itself is hidden away in the recesses of what looks like a tropical forest. Entering a gateway from the road you follow what by courtesy may be termed a path—though there is no attempt made at keeping it up—and soon come to a series of thatched structures, open on all sides. In these a number of women were engaged in the last process of production, so it may be as well, perhaps, to describe what we saw from the commencement, instead of in the order we witnessed it.

The paper is made from the fibrous bark of a tree indigenous to Tonkin, but not growing in the neighborhood of Hanoi. Indeed, we understood it came from some distance. It is first taken to the adjoining canal, where it is soaked for some weeks in the water, which it blackens and fouls. It is then treated with lime in holes hollowed out of the mud above the canal, until it is materially softened, though for how long we failed to ascertain. The now pulpy bark is next conveyed into the village, and having been smashed up roughly is placed in a kind of mortar and macerated into a thick pulp. Next it is put into baskets and then undergoes lengthy washing and churning in the lake. By

this time it has become a gummy kind of substance, and it is taken to tanks in the open sheds already described, and the women receive it in charge. In their hands it undergoes the final process which converts it into a rough but useful paper.

About four women are stationed at each tank, and each is armed with a kind of rattan frame on two sticks, which will shut up or open out. The tank is about half full of pulp in water. The women keep this in constant motion, and with a certain number of motions through it with a rattan frame speedily bring this up opened out, turn it over on what appears a block of dirty-looking, jelly-like stuff, and, with a dexterous movement, peel it off the frame on the block, which is really a pile of paper, as is apparent enough when it dries. The price of the paper is exceedingly low, like every other native manufacture in Tonkin, but the paper-makers seem to be fairly prosperous, and the proportions of the village temple indicated the existence of some spare money. At the entrance there was a life-sized effigy of an elephant, very accurately depicting the noble beast, which is held in great honor in Indo-China.—Correspondence of the Hong Kong Daily Press.



—The Peat Board Co. is the name of a company incorporated in Ontario, with a capital of \$250,000, and head office at Toronto. The Provisional directors of the company are Charles Frederick May, William Geoffrey, Austin Lambe, George Fensom, Thomas Symington and Albert John King.

—The Finnish paper mills are successfully competing with Russia's factories, although they have to pay an import duty. Finland has a better class of help, cheaper and better wood in unlimited quantity, and a water-power that costs nearly nothing. Still, Finland suffers from overproduction, since it lost its power to export to England, being unable to compete with the Scandinavian countries. The future, for Russia's paper making is dark, indeed.

Mill Matters

A company is being formed in Seattle for the purpose of operating a pulp mill at Bella Coola, B.C.

The Trent Valley Paper Co., of Frankford, are erecting a number of cottages for their employees. Crowe & Son, of Trenton, have the contract.

A party, under the guidance of H. L. Gibbs, of Traverse City, Mich., has been looking into the possibilities of establishing saw and pulp mills in British Columbia, probably at Kamloops or up the North Thompson river.

Large extensions are being made to the Gore paper mills at Dundas to accommodate the growing business. A. C. Gunno, of Hamilton, and Joseph Bowman & Co., of Dundas, have the contracts.

W. J. Hill, ex-M.P.P., has secured from the Nepigon Pulp and Paper Company a contract for the construction of a power dam and pulp works at Nepigon. The amount of the contract is nearly \$400,000, which does not include the cost of material.

A survey has been made by W. A. Bauer, of Vancouver, of a limit of 75,000 acres of spruce land on Princess Royal Island, and plans are being prepared for a large pulp mill, which J. J. Palmer, of Toronto, and British capitalists propose to erect. The mill and equipment will cost in the neighborhood of \$1,800,000.

H. L. Frank and John Forman, of Montreal, and Hon. A. E. Spriggs, ex-Lieutenant-Governor of Montana, intend to build a pulp mill at the mouth of the Jacques Cartier river, Quebec, where there is an 8,000-h.p. water power. They own 17,000 acres of spruce, and have leased 187 square miles of timber limits from the Government.

Noel Humphrey, of Vancouver, is organizing a company for the purpose of establishing a pulp mill at a point near China Hat, British Columbia. The mill will have a capacity of 170 tons a day, and will be driven by a stream from

the mountain with a head of 150 feet. It is intended to manufacture paper as well as pulp. Noel Humphrey, of Vancouver, is chief engineer.

The Belgo-Canadian Pulp Company, of Shawinigan Falls, are at present converting their pulp drying machine into news machines, as it is the intention of this company to manufacture twenty-five tons of news per day. It is expected that the machines will be in operation for this material about the month of February. The product of the company will be entirely for export.

It is announced that at a meeting of the Provincial Government, held at St. John, N.B., on November 5th, an increase in the stumpage on lumber cut in the province was decided upon. The new rate will be \$1.50 per thousand feet upon spruce and pine, and in proportion upon other timber. The old rate was \$1 per thousand. In a recent memorial to the Government upon this subject the New Brunswick Lumbermen's Association asked that the increase be not more than \$1.26, but the Association will be notified that \$1.50 has been decided upon.

The Laurentide Pulp Company, of Grand Mere, Que., have just completed the conversion of their pulp drying machine into a cardboard machine, and the first run of cardboard from same was made during the week of November 9th. The machine at present is run by steam, but as soon as the electric installation is completed the new machine will be run with direct connected motor. The brick work on the new mills is advancing rapidly, and the company expect to be ready for the reception of new machinery towards the end of December, which will consist of two newspaper machines. The company will use their own product of ground wood and sulphite, and will manufacture this news paper, and it is expected that this new plant will be in operation some time within the next three months.

An exhibition at Capetown, to open in November, 1904, and continue till January, 1905, is being promoted by the Trades, Markets and Exhibitions, Lim-

ited, Old Broad St., London. If this effort is supported and recognized by the Governments of the South African colonies, it would be well if Canadian paper makers were represented in view of the preferential tariff there now extended to Canada, and of the large imports of South Africa in paper.

The pulp and paper mills of the Eastern Townships of Quebec, in common with those of the Eastern States, are suffering again from low water in the rivers. The Brompton Falls Pulp Mills and the Royal Paper and Pulp Mills' pulp department are closed, while the lumber mills on the St. Francis and Magog rivers are either closed down or running with low power; and if it were not that the Canada Paper Co. has steam power available, it, too, would be crippled in its output. The water in the Eastern Townships rivers is lower than is remembered by any manufacturers of this generation.

Judgment has been given by the Court of Appeal, Toronto, in the case of McKenny v. Lyall. The defendants appealed from the judgment of Judge Meredith at the trial at North Bay, upon the findings of the jury, in favor of plaintiff in an action under the Fatal Accidents Act, to recover damages for the death of plaintiff's husband, who was in the service of defendants, Peter Lyall & Sons, contractors, at the works of the Sturgeon Falls Pulp Co., at Sturgeon Falls, and was killed on March 21, 1902, owing to the alleged negligence of defendants in the condition of a derrick which was owned by the Pulp Company, but in use by defendants at the time of the death. The court held that the judgment for plaintiff was correct.

F. J. D. Barnjum, president and general manager of the North River Lumber Company, states that his company, which cuts and prepares pulp wood for shipment to the State of Maine, doubled its output every year since its establishment in 1900, and next year the same experience would be followed. There have been since the middle of July about one hundred men in the woods, and next

year the drive of pulp wood would be the largest in the history of the enterprise, sufficient, indeed, to keep the mills running all summer. Four cargoes of the product had been shipped already this season, and two more are almost ready for shipment. The company operates in Victoria County, N.S., with headquarters at the village of Murray.

It appears that pulp from wood which has been taken off Crown Lands in Quebec, and made into pulp in an Ontario mill and then exported to the States, is assessed the countervailing extra duty of 25 cents a cord at some ports of entry, but not at others. Milwaukee, for instance, levies the duty, but Plattsburg, N.Y., does not. An order has now gone forth from Washington that the duty shall be levied at all ports of entry.

The recently organized Cornwall Paper Manufacturing Co. decided that it would not begin building operations until the capital stock—\$100,000—was fully subscribed. That preliminary has been accomplished, a considerable sum being subscribed in the country adjacent to Cornwall, and a meeting of the shareholders was held at Cornwall, when the following officers were elected: President, M. P. Davis, Ottawa; vice-president and managing director, S. Greenwood, Cornwall; directors, Col. R. R. MacLennan, C. P. Deruchie, R. J. Pitts, A. F. Mulhern, Cornwall; J. A. Cameron, Dominionville; secretary-treasurer, E. H. Brown, Cornwall. It is intended to get all the material on the ground during the winter, and to begin building as soon as possible in the spring. As already mentioned, the new mill will be located at the foot of Sheick's Island, and will be thoroughly up-to-date in every particular. All the processes will be on one floor, which will conduce greatly to economy of management. Only one machine, but that one of the largest in Canada, will be put in at first, but there will be room to add another should occasion require. The mill will manufacture writing, litho and fine book papers.

The Baie St. Paul mill property and seignory and timber limits, composing about three hundred square miles of territory, has recently been sold to a United States syndicate composed of George Skiff and Charles Skiff, of Syracuse, N.Y.; Emmet G. Latta, of Friendship, N.Y., and John S. Brown and Daniel K. Condon, of Wilcox, Pa. The price paid is said to be \$130,000. The new proprietors propose to develop that part of the province.

Regarding the question of the countervailing duty on pulp going into the United States from Ontario, the Paper Trade Journal says the Board of Appraisers at New York will be pretty sure to decide as in the previous case—that in cases where the pulp is made from wood cut off Crown Lands in Quebec, the extra duty shall be assessed. There is every probability, however, that the decision, whichever way it goes, will be appealed against.

The Strathcona Paper Mills, formerly Napanee Paper Mills, owned by W. J. Finlay, were burnt to the ground on Sunday, 25th October. Part of the stock was saved by the villagers who turned out, but there was little or no insurance on the stock, Mr. Finlay having a few days before cancelled \$3,000 insurance on it. The building was insured for \$8,000, which only partly covers the loss. The monthly pay-roll of the mill was \$600. We understand that the mill will not be rebuilt.

The new paper and pulp mills of the Northern Mills Co., at St. Adele, Que., referred to in a recent number, are situated about 16 miles from St. Jerome, on the Laurentian branch of the C.P.R. A large water power is available here, and this is being developed for the new mills. The pulp mill will have two grinders, and will have a capacity of 10 tons per day. It will be ready for operation in about three months. The paper mill will be completed next summer, and will consist of a main building 260 x 65 feet, and another for the engine room, etc., 125 x 65 feet. The new mills will manufacture fine paper for the export trade in competition with the United States mills.

These mills form a subsidiary company to that of the Rolland Paper Co., of Montreal and St. Jerome. Senator J. D. Rolland, is president, S. J. B. Rolland, general manager, and Octavian Rolland, vice-president. The superfine linen record and parchment papers produced by this company have long had a high reputation in the Canadian market, and now their quality is becoming known abroad, especially since they carried off the Grand Prix, the highest award, at the Paris Exposition in competition with the world; after winning the gold medal for their papers at the Chicago World's Fair. Canadians from every province will naturally feel proud that a mill owned and operated entirely by their French-Canadian fellow citizens has achieved such distinction, and will wish that the new mills now being equipped will have every success in gaining a permanent place in the markets of the world.

The last annual report of the St. John Sulphite Pulp Co., Ltd., for the year ended May 31st, shows that there has been a loss on the year's working of £6,686 3s. 6d., and that after adding the debit balance in 1902, of £1,189 10s. 5d., there is a balance of £7,875 13s. 11d. at the debit of profit and loss. The improvement which the directors expected towards the end of last year did not take place, and while prices remained unprecedently low, the cost of raw material had increased. At the date of the formation of the company the price per ton of pulp was £9 5s., while at the present time it is only £6 15s. On the other hand, the cost of the raw material is now higher by about £1 per ton than it was when the company started. However, the company will at least be able to hold its own, and will continue the works till the close of the year, when they will shut down. Mr. Mooney, the company's manager at St. John, who is a shareholder to a large extent, has, on account of failing health, been obliged to tender his resignation. The directors report that, to provide funds for the carrying on of the company's business, they arranged for an advance of £15.

ooo from the Royal Bank of Scotland on the security of a mortgage over the company's property, coupled with the personal obligation of three of their number as collateral. This advance has been exhausted, and it will be necessary to provide additional capital if the works are to be carried on.

LITERARY NOTES.

The St. Bride Foundation Institute is a social and technical institution for the benefit of printers and those in allied trades in the parish of St. Bride, London. It has technical classes, chiefly in the printing, lithographing and engraving trades, and is affiliated with a number of other institutions. The 7th annual report just received shows the institute to be progressing. It appears to have a good technical library. It is situated in Bride Lane, Fleet St.

The Canadian Magazine for November has a timely article by E. Stewart, Superintendent of Forestry for the Dominion Government. Mr. Stewart warns our public men that the world's supply of timber is rapidly running short and that the nations are nearing a wood famine. He gives facts and figures which reinforce the able presentment of the case made by George Johnson, the Dominion Statistician in the first number of the Pulp and Paper Magazine. With the increase of manufactures of all kinds the consumption of timber has increased in a higher ratio than ever in the world's history and the depletion of forests has been particularly marked since the production of paper from wood pulp has been taken up by manufacturing countries. There are now only half a dozen countries in the world which can export timber in any large quantity, namely, Austria-Hungary, Russia, including Finland, Sweden, Norway, the United States and Canada; and of these only Sweden, Finland and Canada may be said to have wood in abundance. All other countries have come to realize that they must manage their forests with the strictest care to conserve one of the greatest assets that Providence can bestow on any

land; and the writer draws the moral that Canada should now lay out her forest policy on a broad, sound base, so as to ensure not only a permanent revenue, but a safe reliable water supply for our rivers.

Of much interest to all who understand the importance of our timber policy, is the report on "Forestry and Colonization," just issued from the press of John Lovell & Son, Montreal, by Hon. G. W. Stephens, late Commissioner of Colonization for the Province of Quebec, and one of the special commissioners appointed last year by the Quebec Government to report on the forests of the Province. One commissioner died soon after his appointment, and the other resigned, leaving to Mr. Stephens a task which he has performed with eminent ability and thoroughness. We hope to present some of the commissioner's conclusions in next issue, and can only now say that his report of 100 pages is summarized in 33 recommendations, among which are the establishment of forest reserves, a system of scientific afforestation of burnt districts, the study of forestry in the universities, reform in the method of selling timber limits, and of dealing with crown lands, and reform in the system of leasing water powers, so that the speculative holding of these assets should be done away with.

We have received a copy of the "Paper Makers' Directory of All Nations," for 1903, published by Dean & Son, Ltd., 160a Fleet St., London, Eng. It includes Canada and the United States, and is in fact, what its name implies, a universal paper mill directory, giving the usual particulars as to capacity and product of each mill, the number of machines, kind of power used, telegraphic address, etc., with classified lists of the mills engaged on each kind of paper and pulp. This is the 12th edition, and one of the features of the present issue is a list of merchant shippers of paper, naming the countries to which they principally sell. The book is a handy volume of 536 pages, (size 5x8 in.), is neatly printed on good paper, and the price is only \$2.75 post-paid to Canada.

THE COUNTERVAILING DUTY CASES.

(FROM THE PAPER MILL, N.Y., NOV. 14TH.)

Seventeen gentlemen assembled in the board room at the Appraisers' Stores on Wednesday with the expectation of learning a whole lot about the matter of the assessment of the countervailing duty on certain wood pulp imported from mills situated in Quebec Province. Interesting developments were expected, but there was nothing to warrant the expectation. Two of the seventeen were General Appraisers Somerville and Fischer, who sat judicially upon the affair. A third was Mr. Washburn, the Government counsel. Then there were Richard R. Martin, of the firm of Cokingham, Sherman & Martin, of Utica, and John R. Meyers, of Rouse's Point, N.Y., the legal representatives of the various Canadian companies, who have protested against the assessment of the countervailing duty. Then there was W. W. Bean, of Boston (how did it happen?), a special agent of the Treasury Department, who had been rummaging over the books of the various Canadian companies, and also of the Crown Lands Department, who were very accommodating, by the way, in allowing a Yankee sleuth access to their facts and figures. Then there was a stenographer who made records of things, and there were George E. Challes, of the Riordon Paper Mills, Limited, of Merriton and Hawkesbury, Ont.; W. T. Robinson, treasurer of the Laurentide Pulp Company, Limited, of Grand Mere, Que.; Hubert Bierman, manager of the Belgo Pulp and Paper Company, formerly known as the Belgo-Canadian Pulp Company, of Shawinigan Falls; Alexander O. Anderson, secretary of the James MacLaren Company, Limited, of Buckingham; William M. Munroe, treasurer of the Brompton Pulp and Paper Company, of Brompton Falls. Also Fremont W. Spicer, of the North Shore Power, Railway and Navigation Company, who was much interested in a disinterested fashion. He has not been compelled to pay

any countervailing duty as yet. The others of the seventeen were lookers-on in Vienna and seekers for sensations.

There wasn't any sensation, because the "spell-binding" which had been expected on the subject was postponed until later, probably December 4th, and the proceedings were confined entirely to the submitting of affidavits, correcting and adjusting sundry details of those presented at a hearing held last June; and the quiet and courteous and deferential examination of Mr. Bean, of Boston, and of all the various Canadian gentlemen, as regards the fractions of percentage of wood used in various mills coming from the Crown lands, and from lands held in fee. One reason for the postponement of the arguments in the case was the absence of Mr. Cokingham, senior counsel for the Canadian companies who have protested against the assessment of the duty. Mr. Martin, his partner, did not feel equal to the spell-binding task, and Mr. Washburn, the Government counsel, was exceedingly courteous in his assent to the postponement of argument.

The reason for all this as doubtless the readers of The Paper Mill already know, is that while the Province of Quebec will allow pulp wood cut upon Crown lands to be exported to the United States, it gives a rebate of 25 cents per cord of the stumpage on all such wood that is ground into pulp in Canada. Of course, Uncle Sam has to see this raise, and, therefore, when the pulp made of such wood, upon which a rebate has been allowed, appears on the border line, he puts on an extra duty of 25 cents per ton, in order to even things up. This is not to the likings of the Canadians. Moreover, the interesting question is raised, How in the mischief is anybody to tell on the border line, when the pulp awaits permission to enter the United States, whether it is made of wood cut upon Crown Lands affected by the rebate in stumpage, or upon private lands, the wood from which may be exported into the United States without let or hindrance by the Dominion or Provincial Government?

The method of solving the question which appears to meet with favor on this side of the line is to ascertain the percentage of wood coming from Crown lands, and from private lands, used in each mill, and average the thing up on the pulp imported; and as a means to this end various affidavits were presented at a former hearing, and various others in correction of those were submitted at the hearing on Wednesday. Likewise, Mr. Bean, of Boston, fortified by several reams of typewritten paper, neatly tied together in broken ream lots, and stabbed with paper fasteners, disclosed the results of his rummaging in the books of the manufacturing companies and of the Crown Lands Department.

For example, it appeared that of the wood used by the Laurentide Pulp Company, Limited, during the year ending June 30, 1903, 82.6 per cent. came from Crown lands, and 17.4 per cent. from private lands. There was a discrepancy between the figures and some that were submitted in June last, the whole business amounting to two or three hundred cords; and this discrepancy was discovered when Mr. Bean, of Boston, poked over the figures of the Crown Lands Department. This was why Mr. Robinson, the treasurer of the Laurentide Pulp Company, came forward to explain that the few cords in question had been purchased by his company from farmers or dealers in wood as coming from private lands; but that it afterward proved that the farmers had "pinched" it from Crown lands. Incidentally, it came out that when the pulp company had any suspicion of such dealings, it withheld from the price paid to the farmer a sum sufficient to pay the stumpage, in case the farmers were caught, not exactly in "flagrante delicto"; but afterward. Incidentally, it was remarked by one of the gentlemen (not in the course of proceedings, but as an aside), that some companies in Canada proceeded on the assumption that every farmer "hooked" the wood that he sold to them, and retained a certain proportion of the purchase money in every case, until the

purchaser had become fully satisfied that the wood was honestly cut on lands held in fee simple.

It also appeared in the course of proceedings that the Belgo Pulp and Paper Company, formerly the Belgo-Canadian Pulp Company, had used in the year ended June 30, 1903, 30,888 cords of Crown lands timber and 7,021 cords of private land timber, and that about one-half of the product of the mill had been shipped to America. For some reason, the courteous Mr. Washburn desired to know just how the different kinds of wood were kept separate at Shawinigan Falls, and it was a little difficult to ascertain. Mr. Bierman was ready to tell all he knew about it, but as he is rather more familiar with the Belgo-Canadian tongue than with Uncle Sam's lingo, explanations of considerable length were necessary. Anyhow, it appeared that the wood was piled in different piles, and that during the first four months of the year the mill usually ran on private land wood, and the rest of the year on Crown land wood.

Mr. Anderson, of the MacLaren Company, showed that during the year ended June 30, 1902, his concern used 3,966 $\frac{7}{8}$ cords of Crown lands pulp, and 14,105 $\frac{1}{8}$ cords of wood cut on private lands, and that during the year last past the supply from Crown lands was increased to 9,805 cords, and that from private lands decreased to 11,834 cords. Mr. Bean, of Boston, incidentally remarked that about one-half of the product of this mill was shipped to the United States. There were considerable explanations concerning a matter of 6,000 cords of wood taken from private lands, which Mr. Bean was compelled to chase through the lumber yard, into the pulp mill, and back to the lumber yard again. It finally came out that this wood was cut in logs sixteen feet in length, and was originally intended for manufacturing into lumber. Then it was set apart for use in the pulp mill, and then finally the owners changed their minds about these particular sticks, and concluded to saw them up instead of grinding them.

Proceeding in the enquiry, it was dis-

covered by Mr. Washburn that the Jacques Cartier pulp Company, of Pont Rouge, did not use any Crown land timber. Then, in the course of time, it was learned that the Riordon Paper Mills, Limited, which owns mills at Merriton and Hawkesbury, produces about eighty tons of sulphite at the Hawkesbury mill, of which 80 per cent. is shipped to the United States, and makes sundry sulphite at Merriton, of which about one-half is shipped into this country. According to Mr. Challes, there were used in the Hawkesbury mill in the year ended June 30, 1903, 517,652 pieces of wood cut on Crown land, and 50,976 pieces which came from private lands. The size of the pieces was not mentioned, but it was figured that 9 21-25 per cent. of the wood came from private lands. Mr. Bean had discovered fourteen cords of wood around the Hawkesbury mill which might be classed as orphans, although he lumped them with the Crown lands timber. Considerable time was taken in making it exactly clear to the courteous Mr. Washburn where these fourteen cords of wood came from; a very important matter, as the rebate upon it would amount to \$3.50, provided it was Crown land timber. It was also remarked that the Riordon people had any quantity of wood hung up in the rivers, and that they might have to buy several thousand cords of wood from farmers and others owning lands in fee, in order to keep their mills going.

As to the Brompton Falls Mill, there was not very much in the evidence that was interesting. The mill got into action in April last, in the manufacture of mechanical pulp, or, as the courteous Mr. Washburn called it, at various times during the explanation, chemical ground pulp; a new species of product, which probably he has been able to discover through the investigations of Mr. Bean, of Boston. It appears that all the wood they have used since they started up was cut on private lands, although as a matter of fact they have already bought 500 cords of wood that was cut on Crown lands; but they have not ground it up yet.

STEBBINS ENGINEERING AND MANUFACTURING CO.

The Stebbins Engineering and Manufacturing Company, of Watertown, N.Y., has been incorporated under a New York charter. It is to carry on the business of architectural, mechanical, electrical, chemical, hydraulic and civil engineering. The capital is \$75,000, and the directors for the first year are George A. Stebbins, August F. Richter and Henry W. Stebbins, of Watertown. This is the outgrowth of a successful business venture launched about five years ago. Henry W. Stebbins, after practically a lifetime spent in the outfitting of pulp and paper mills, in which line he became a recognized mill expert, began business with A. F. Richter, under the firm name of Stebbins & Richter. Later Mr. Richter retired, and Mr. Stebbins' son, George A. Stebbins, B.S., a graduate of the Potsdam School of Technology, became associated with his father in the conduct of the business under the firm name of H. W. & G. A. Stebbins, which is well-known in the paper industry. The past records of the plants which have been designed and erected by Mr. Stebbins and the successes scored by them are assurance of the success of the new company. Mr. H. W. Stebbins will be president of the new concern, George A. Stebbins secretary and treasurer, and A. F. Richter vice-president and general manager.



—It is not likely that the total St. John river lumber cut this winter will be as heavy as in previous years, because there is about 40,000,000 to come out besides what may be cut, and generally the prospects for lumber market next year are not considered good. A slump in the United States market is feared, and operators say it would have come this year but for the hang up of logs in the Maine rivers.—St. John Sun.



—Sivadi metal is something new in Great Britain. It has, says an exchange, been now in extensive use for some time

in the form of roller bars, bottom plates, refining engine bars, doctor plates, and for other purposes, and very severe tests show the metal to very great advantage. The agents say their clients in the paper trade who are using the metal are thoroughly pleased with it. It is recommended for its good wearing qualities and its comparative freedom from corrosion.



PERSONAL.

Walter Morey, for the past twenty years an employee of the Canada Paper Co., has accepted a position in the paper mill at Thorold, Ont.

Willis S. Gerry, foreman of the finishing department of the Hampshire Paper Company, South Hadley Falls, Mass., has resigned, to take a position in the Toronto Paper Co.'s mill at Cornwall, Ont.

The friends of John R. Barber, of Wm. Barber & Bro.'s paper mills, will be glad to hear that he has quite recovered from the severe attack of lumbago, which laid him up at the hospital in Toronto last month.

Wm. Sinclair, representing the International Paper Co., in Great Britain, recently visited America, on the invitation of President Chisholm, and before returning, made a trip through some of the pulp and paper making regions of Canada.

Howard Wilson, president of the J. C. Wilson Paper Co., Montreal, was a recent visitor to Winnipeg, where his company now has a branch warehouse.

J. D. Finlay, for several years manager of the Toronto Paper Company, Cornwall, is now superintendent of the Syms & Dudley Division of the American Writing Paper Company at Watervliet, Mich. The Watervliet Record congratulates him upon his success in running the paper mill since he came there, and learns that the superior officers of the company from Holyoke, Mass., are well pleased with the profitable handling of the mill.

W. D. Gillean, for thirty years con-

nected with the paper trade, and for several years assistant to the managing director of the Canada Paper Co., has opened up offices at 22 St. John St., Montreal, as a manufacturers' agent in paper and pulp mill supplies. Mr. Gillean's first connection with the Canadian paper trade was as a member of the staff of Angus, Logan & Co., in 1866, and he remained with the firm till after it was merged into the Canada Paper Co., in 1873. His extensive experience in the business should ensure him some good connections.



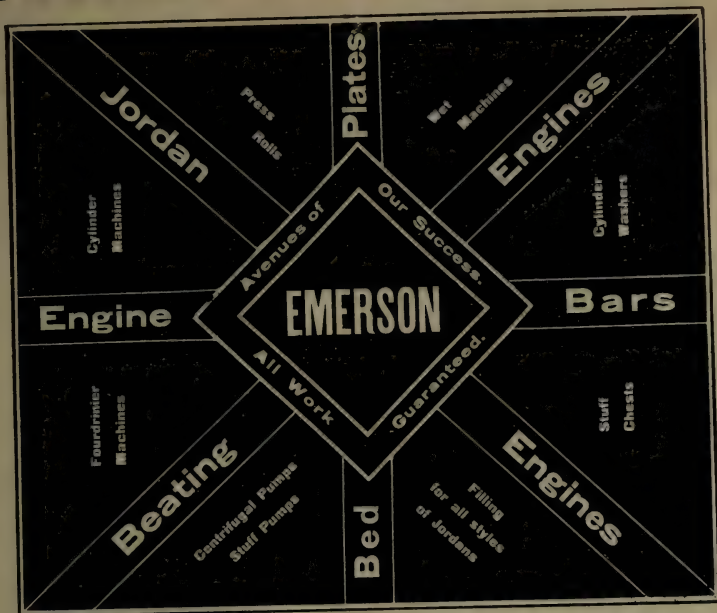
There are now 29 grinders at work in the mills of the Chicoutimi Pulp Co., and the company has contracted for getting out a million and a quarter feet of pulpwood this winter.

—It is quite astonishing, says the Montreal Witness, to see the number of pretty and useful articles that can be made from crepe paper, tissue paper, etc. The ladies of Erskine Church had a sale in which paper goods were an important feature, the ladies wearing white dresses and poppy hats.

—An article in Newspaperdom, referring to Alfred Harmsworth's purchase of a forest in Newfoundland half the size of the State of Vermont, says he intends not only to build his own paper mills, but to transport the product to England in his own ships. The Harmsworths have an engineer now in Newfoundland looking over the ground for mill sites.

Messrs. Shields and Coyne, of Sault Ste. Marie, have been visiting Newfoundland, to lend their expert knowledge to the Timber Estates Company, who contemplate the establishment of an immense pulp and paper making plant at Red Indian Lake. At the "Soo" there was a large pulp factory, and Mr. Coyne had special charge of it. They will now look over the pulp areas, water-powers and other factors in the starting of such an enterprise, and by their judgment the Timber Company will be guided very largely in their future course.—Herald, St. John's, Nfld.

EMERSON MFG. CO.



LAWRENCE, = = = MASS. ^F

FAIRBANKS ^{RENEWABLE SEAT} GATE VALVES

ALL PARTS RENEWABLE AND INTERCHANGEABLE.

*Longest Wearing.
Most Economical.*

Two Renewable Seat Rings

Vulcabineston or Bronze,
AS DESIRED.

RENEWABLE WEDGE.—MADE IN ALL SIZES
BRASS OR IRON.

Universally Used in Pulp and Paper Mills.

SEND FOR VALVE CATALOGUE.

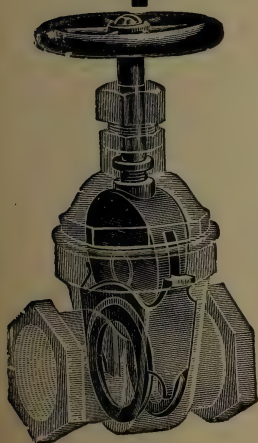
THE FAIRBANKS COMPANY,

MONTREAL.

TORONTO.

VANCOUVER.

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ESTABLISHED 1842.

Cheney-Bigelow Wire Works

SPRINGFIELD, MASS.

... Manufacturers of ...

FOURDRINIER WIRES

CYLINDER MOLDS, DANDY ROLLS

— ALSO —

Brass, Copper and Iron Wire Cloth

SOLE MANUFACTURERS OF THE

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Bell Patent Flat Wires for Book Papers

WATSON JACK & COMPANY,

MONTREAL.

Paper Blues

Prussian Blues

Paper Anilines

Shades Matched Promptly.

F

Send for Color Cards and Prices.

MARKETS.

The cut of timber this winter in Canada is not expected to be up to the average. A large operator in Ontario says it will not be more than two-thirds. One cause is the uncertainty of the United States market, and the other is the scarcity of experienced bushmen, who have been attracted into other employments. This restriction of the cut, combined with the steady demand from Great Britain will naturally tend to keep up prices. Sulphite pulp is firm at 1.85 to 2c. per lb., and owing to the state of the rivers in Eastern Canada and the States, no one need be surprised to see it soon quoted above the latter figure. For the same reason ground wood pulp is firm at rates last quoted.

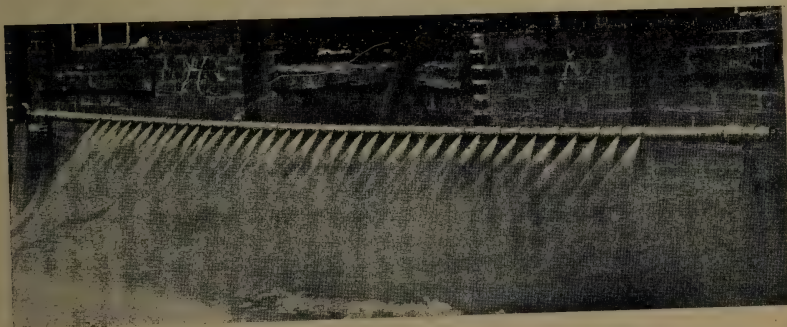
A few days ago there was a meeting in New York of representatives of all producers of bleach, both domestic and foreign, to determine the price of bleaching powder for the coming year. The meeting is said to have been a lively one.

but the final agreement was to continue the price at $1\frac{1}{4}$ cents per pound as during the present year. That is, $1\frac{1}{4}$ cents ex dock in New York for foreign, and f.o.b. works for domestic, but in both cases there is an "equalization" provision in the agreement whereby it is intended to make the cost to the consumers uniform. For instance, if one consumer has a ten-cent freight rate and another has to pay fifteen cents, the latter is entitled to a rebate of five cents per hundred pounds, a provision that may cause trouble. This low contract price is due to the very severe competition of the past two years. Within the past six months this competition has been fierce. Overproduction is said to be the cause. Within the past two years the production in the United States is said to have been doubled. The chief increase in the production, however, has been with the German manufacturers, who use the electrolytic process, and market the product in England and the United States. At the contract price

The Sandusky Foundry & Machine Co.,

Founders and Machinists. — Sandusky, Ohio.

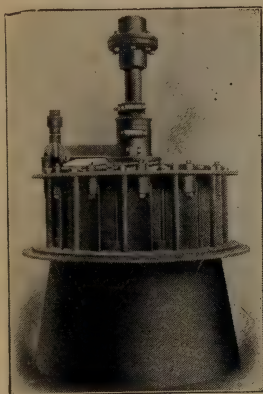
The Millspaugh Patent Shower Pipe System.



100 per Cent. on an investment looks big to paper men these days. The installation of Millspaugh Patent Shower Pipes has paid **100 per cent. or more in nearly all our equipments.**

DOES THIS INTEREST YOU? WE are ready to **PROVE IT** by **GUARANTEED INSTALLATION** where we have the chance to inspect fully your present system. — **SEND FOR US ANY TIME.**

The SAMSON Turbine.



Proven by Actual Duty
to be the best for Driv-
ing Pulp Grinders and
Paper Mill Machinery.

The Wm. Hamilton Mfg. Co., Limited
PETERBOROUGH, ONT. F

H. W. STEBBINS, Pres.

A. F. RICHTER, Treas.

G. A. STEBBINS, Sec'y.

— STEBBINS — Engineering & Mfg. Co.

Paper and Pulp Mill
Engineers and Architects.



EXPERTS IN THE CHEMICAL PRO-
CESSES OF PRODUCING PULP FROM
ALL KINDS OF MATERIAL.

— MANUFACTURERS OF —

The Stebbins Patented Acid Systems, Digesters and their Linings,
Bronze, Lead and Cast Iron Fittings.

We design, construct, equip and operate mills for the manufacture of
Pulp and Paper and all processes allied thereto.

WATERTOWN, N.Y.

Office, 74-78 Smith Building.

F

there is no profit in the business, so the selling agents assert. Sales at less than 1¼ cents have been numerous within the past few months. It is thought that a continuation of the cutting will finally result in a combine.

THE RAG AND PAPER STOCK MARKET.

Owing to the dry weather during the past two months the output of many of our paper mills has been more or less restricted for want of water power. The demand for paper stock has consequently been less active. On the other hand, the supply of domestic rags is limited, and smaller this year than usual. Prices continue about the same. Cotton rags are a little firmer, and waste paper stock in fair demand. Manilla rope is easier, and any sales that have been made are mostly for export to the States.

Domestic white rags	\$2.00 to \$2.10	per 100
Blues and thirds	1.15 to 1.25	" "
Dark cottons	75 to 90	" "
Roofing paper stock	45 to 50	" "

Waste papers	35 to 45	" "
Hard white shavings	2.00 to 2.10	" "
Soft white shavings	1.00 to 1.25	" "
Book stock	75 to 90	" "
Manilla rope	1.90 to 2.10	" "
Mixed bagging	55 to 65	" "
Sisal and jute string	75 to 1.00	" "
Flax tow	1.10 to 1.25	" "

Capt. Partington, of the Cushing Sulphite Fibre Co., in an interview with the Paper Maker, of London, is reported to have made this reply to the question, "What about Canada?" "Oh, Canada is all right, but the pulp trade is not in a healthy state—too many people in the business who don't understand it, and lots of money is being lost. In the chemical pulp, business is very bad, and we have shut down the Cushing mill at St. John, (N.B.), as we had lost so much money through dear wood." This is a rather astonishing statement considering that the Cushing mills were running at the time he spoke, were running when he left St. John, and have been running ever since.

JAMES KENYON & SON,

Telegraphic Address "KENYON-BURY"

DERBY STREET MILLS

Telegraphic Address "KENYON-BURY"

BURY, = LANCASHIRE

Manu-
facturers
of

FELTS

For
Paper
Makers.

Couch Roll Govers, Wet and Dry Felts
of all kinds, including

Patent Cotton Dry Felts

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Special attention paid to felts for fast running news machines

A. WERTHEIM & Co.

HAMBURG.

IMPORT AND EXPORT ALL KINDS OF

***Sulphite,
Soda and
Mechanical***

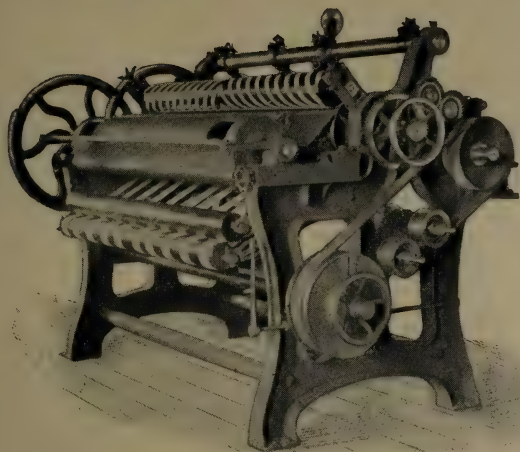
WOOD PULPS

OFFICES AT:

CHRISTIANIA (Norway)	..	Kirkegaden No. 20.
GOTHENBURG (Sweden)	..	Lilla Kyrkogatan No. 20.
MANCHESTER	.. ..	Guardian Buildings (opposite Exchange).
LONDON	.. .. .	77a Queen Victoria Street, E.C.
PARIS	.. .. .	Rue de Londres No. 29.
ANGOULEME (France)	..	43 Rue Louis Desbrandes.
LYONS	.. .. .	54, Cours Gambetta.
MILAN	.. .. .	3 Via Gius. Verdi.
TOLOSA (Spain)	.. .. .	18 Calle San Francisco.
ST. PETERSBURG	.. ..	Little Pedjascheskaja House, 4, Qu. 16.
NEW YORK	.. .. .	99 Nassau Street.

Telegraphic Address :

"WERTHEIMO, HAMBURG."

Our Specialty**Revolving Paper Cutters**

The Hamblet Machine Co., LAWRENCE, MASS.

Successor to Dustin Machine Co.

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C. H. SMITH & Co., Patentees and
Sole Manufacturers of —

Beware of



Imitations.

The Original Hollow Truss Dandy Rolls.

Artistic Water - Mark Work a Specialty.

Over 3,800 in use.

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HOLYOKE, Mass., U.S.A.

THE PUSEY & JONES COMPANY

Wilmington, Delaware, U.S.A.

BUILDERS OF

Machinery for Paper Mills and Pulp Mills

REPRESENTED BY

The WM. HAMILTON MFG. CO., Ltd., PETERBOROUGH, Ont., Can.



Beloit Iron Works

Paper Mill Machinery.

Guaranteed the most serviceable and efficient
of any built.

Modern Designs, New Patented Ideas,
Used Exclusively by us.

Cylinder and Fourdrinier Machines.
Tissue Paper Machines a Specialty.

BELOIT IRON WORKS,
BELOIT, WIS., U. S. A.



BOILERS FOR SALE. —We offer for sale the following Horizontal Tubular Boilers at low price f.o.b Windsor Mills, P. Q. The boilers are complete with usual fitting and cast iron fronts. All are in operation and in good working order but are being replaced by larger units.

BOILER NUMBER THREE	13' 8" x 60"
Number and size of tubes	64, 3½"
Dome	30" x 30"
Pressure allowed for next ten years, 100 lbs. per sq. in.	
BOILER NUMBER FIVE	16' x 66"
Number and size of tubes	108, 3½"
Dome	36" x 36"
Pressure allowed for next ten years, 100 lbs. per sq. in.	
BOILER NUMBER NINE	14' x 60"
Number and size of tubes	64, 3½"
Dome	36" x 36"
Pressure allowed for next ten years, 100 lbs. per sq. in.	

BOILER NUMBER EIGHTEEN, Twin	14' x 60"
shell, lower shell	120, 3"
Number and size of tubes	30"
Diameter of upper shell	36"
Thickness of plates	7/8"
Double riveted.	
Pressure allowed, 80 lbs. per square inch.	

BOILER NUMBER NINETEEN—	14' x 60"
Lower Shell	66, 4"
Number and size of tubes	
Pressure allowed, 60 lbs. per square inch.	

CANADA PAPER CO. Limited, Windsor Mills, Que. FT.

DR. C. WURSTER'S Patented Pulping Engines and Kneaders

FOR PULPING-UP

**Dry Wood Pulp, Machine "Broke," Old Paper Stock,
Waste Papers.**

MADE IN THREE SIZES TO PULP THREE, SIX
AND NINE TONS DRY WOOD PULP IN
TWENTY-FOUR HOURS. — FIVE, EIGHT AND
TWELVE HORSE POWER REQUIRED.

£125, £150 and £200 c.i.f. U.K. Ports.

Beaters and Edge Runners can be filled in from one to two minutes if the pulp is first disintegrated by one of the Wurster Engines, while the output is larger with the same power. These Engines do four times the work of stones, and neither shorten, affect, crease, or wet the fibre in any way, nor change the color or the sizing. They can also be used for Kneading Clay and other Fillers, and Bleaching Powder.

For full particulars apply to

**DR. C. WURSTER, 29 Abbey Road, St. John's Wood, LONDON, N. W.
ENGLAND.**

HIGH GRADE .. Easy Bleaching,
SULPHITE PULP Clean and
Uniform in Quality.

Specially suitable for the manufacture of WRITING, BOOK,
and other PRINTING PAPERS.

The Cushing Sulphite Fibre Co., Ltd., ST. JOHN, N.B.
Canada.



Auction Sale of Timber Berths.

PUBLIC NOTICE is hereby given that pursuant to authority of Orders in Council, the Red and White PINE TIMBER in the following townships, berths and areas, namely:—

IN THE DISTRICT OF NIPISSING—the Townships of Hutton, Creelman, Parkin, Aylmer, Mackelcan, McCarthy, Merrick, Mulock (part of), French (part of), Stewart, Lockhart (part of), Garrow (part of), Osborne (part of), Hammell and Phelps (part of).

IN THE DISTRICT OF ALGOMA—Berths Nos. 195 and 201, the Townships of Kitchener and Roberts and Block "W" near Onaping Lake.

IN THE RAINY RIVER DISTRICT—Berths G19, G21, C23, G29 and G38, and the following Berths with the right to cut and remove the pine, spruce, tamarack, cedar and poplar:—G4, G6, G17, G18, G24, G25, G26, G27, G28, G33, G35, G36, G37, G39, G40, G41, G42, G43, Berths Nos. S1, S2, S3 and S4, will be offered for sale by Public Auction at the Parliament Buildings, in the City of Toronto, on WEDNESDAY, the NINTH day of DECEMBER, 1903, at the hour of ONE o'clock in the afternoon.

Sheets containing terms and conditions of Sale and information as to Areas and Lots and Concessions comprised in each Berth will be furnished on application, either personal or by letter, to the Department of Crown Lands, Toronto, or the Crown Timber Agencies, at Ottawa, Sault Ste. Marie, Port Arthur, Rat Portage and Fort Frances.

E. J. DAVIS, Commissioner Crown Lands.

Department of Crown Lands,
Toronto, July 29, 1903.

N.B.—No unauthorized publication of this advertisement will be paid for.

NOTICE.

Notice is hereby given that the Red and White Pine Timber in the Township of Chesley, Additional, will be sold by public auction at the Parliament Buildings, Toronto, on the 9th of December next.

For list of Berths, terms and conditions, etc., apply to the Department of Crown Lands, Toronto.

E. J. DAVIS, Commissioner Crown Lands.

Department of Crown Lands,
Toronto, Oct. 30th, 1903.

BECKER & CO.

64 Cannon St., London, E.C.

Also Manchester, England, and Hamburg, Germany

The Largest Importers

of Wood Pulp Into

Great Britain

SOLE BRITISH AGENTS FOR

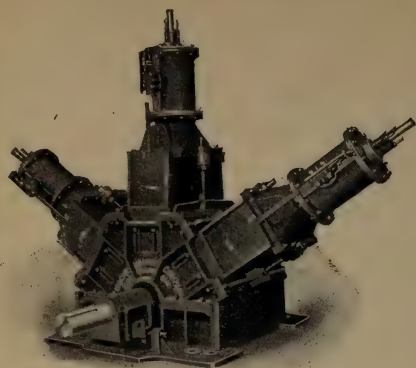
Chicoutimi Pulp Co., Limited, Chicoutimi, Quebec.

Acadia Pulp and Paper Co., Limited., Halifax, N.S.

Nova Scotia Wood Pulp Co., Mill Village, N.S.

CANADIAN REPRESENTATIVE :

W. P. RYRIE,
50 BAY ST., TORONTO.



The "EXPRESS" Grinder

This grinder is our latest achievement in this line, and it's one we're proud of.

Since designing them a number have been installed in different mills throughout the country, to whose managers we will refer for information on their efficiency and power.

Direct connected to one of our Crocker Patent Turbines,
this grinder is uniformly satisfactory.

The Jenckes Machine Company, Limited

1017 LANSDOWNE STREET,

Sherbrooke,

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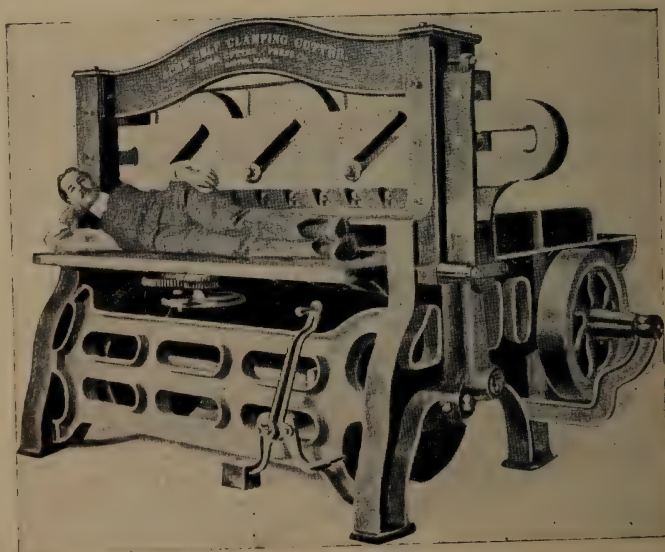
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Quebec.

Acme Paper Mill Cutter.



Automatic Self-Clamping Cutter.

CHILD ACME CUTTER & PRESS Co., 33-37 Kimble St., Boston, Mass.
New York, - 12 Reade Street.

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WIRE PULP MATS

Perforated Copper, Brass and Steel.

WIRE ROPE = All Kinds. F

Wire Guards for Mill Windows. Refuse Burner Cloth, etc.

The B. Greening Wire Co., Limited,
HAMILTON, Ont. - - - MONTREAL, Que.

DICK'S Balata BELTING.

The Strongest Belt in the World, and specially adapted for Pulp and Paper Making.

LARGE STOCK always on hand.

J. S. YOUNG, - - Sole Agent for Canada.
413 St. Paul Street, Montreal. F

Before Starting with the Erection of a

PULP MILL

Write to Us.

We are the Pioneer makers of Pulp Mill Machinery in Canada, and can design and equip a mill throughout

— ADDRESS —

Carrier, Laine & Co.,

LEVIS, . . . Que. F

Waste Paper. Rags. Rope.

R. HOUGH, LONDON,

ENGLAND.

Agent for Canada and U. S., - - J. CHRISTIE,
67 Yonge St., Toronto, Canada.

FELTS

For Paper
and Pulp
Manufacturers

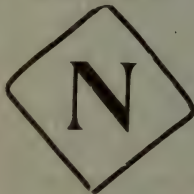
SAMUEL PORRITT & SONS, LTD.

Bamford Woollen Mills, Nr. Rochdale, England.

Agent for Canada—JOHN CHRISTIE, 67 Yonge St., Toronto.

CHINA CLAY

BRAND



E. E. NICHOLLS & CO.

St. Austell,

Cornwall,

**Selling Agent for
Canada and U.S.**

J. CHRISTIE, 67 YONGE STREET, Toronto, Canada.

England.

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MONTREAL AND TORONTO

Vol. 1.

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The Largest Fourdrinier Wire Plant in the World

Eastwood Wire Mfg. Co.

Belleville, New Jersey, U.S.A.

MANUFACTURERS OF

FOURDRINIER WIRES,
CYLINDER and WASHER WIRE CLOTH,
DANDY ROLLS,
CYLINDER MOULDS,
ROLLED BRASS SCREEN PLATES,
PERFECTION BRONZE (cast metal) SCREEN PLATES,
SUCTION BOX COVERS, COUCH ROLLS,
NAME PLATES,
PERFECTION BRONZE, DIGESTER CASTINGS and Y VALVES,
for the manufacture of SULPHITE WOOD PULP,
PERFECTION BRONZE VALVES, bolts and fixtures, for SUL-
PHITE PROCESS.
BRASS, COPPER and IRON WIRE and WIRE CLOTH of every
description,
BABBITT METAL and all grades of ANTI-FRICTION METAL.
BRONZE and BRASS CASTINGS, from 1 oz. to 20,000 lbs. in weight.

N. B.—We manufacture all of the above articles, not merely
dealers. Write for prices to

EASTWOOD WIRE MFG. CO.,

BELLEVILLE, NEW JERSEY, U.S.A.

The Largest Fourdrinier Wire Plant in the World

Foreign PHOSPHORBRONZE Fourdrinier Wire.
 Sulphite Pulps, Paper Stock and Rags.
 Bleached Straw Pulp, also
 China Clay,

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JEAN FREESE, Vanderbilt Building
 132 Nassau Street, **NEW YORK.**

FOURDRINIER MACHINE WIRES CYLINDER COVERS

Unequalled for Strength, Smoothness and Long Life.

GEORGE CHRISTIE LIMITED

Ladywell Wire Works, **GLASGOW, SCOTLAND**

Agent—**THOMAS L. PATON,** 30 St. Francois Xavier Street, **Montreal,** who
 holds stock for immediate delivery.

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E. J. WELCH, Supt.

EMMONS CROCKER, Treas.

Union Screen Plate Co.

Sherbrooke, Canada, Fitchburg, Mass., U.S.A.

LARGEST MANUFACTURERS OF

Screen Plates

IN THE WORLD

The "Union" Bronze (best cast metal) Plates for Sulphite Mills. The Standard
 Rolled Brass Plates. The "Union" Cast Metal Suction Plates.

Old Plates re-closed by our process are practically as good as new and give
 better results than by any other process.

We shall keep on hand at our Sherbrooke Works a large stock of the different
 sizes of both metals and can fill large orders promptly.

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BERTRAMS, LIMITED

Papermakers'

Engineers

***St. Katherine's Works,
SCIENNES, EDINBURGH.***

The Newest and most Up-to-date Machinery for Papermakers,
embracing British, American and Continental Improvements.

REPRESENTED BY

**C. H. JOHNSON & SONS, LIMITED, WIRE WORKS,
ST. HENRY, MONTREAL.**

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C. H. JOHNSON & SONS, Ltd.

ST. HENRY, MONTREAL,

MANUFACTURERS OF

Fourdrinier Wires, Cylinder Wires,

***Brass, Copper and
Iron Wire Cloth.***

Dandy Rolls. - Watermarking

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Hardy, George F.	7	Wurster, Dr. C.	19
Hanson's Woolen Mills	7	Young, J. S.	23
Hough, R.	24		

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SHEFFIELD, - ENGLAND.

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SWEDISH BESSEMER STEEL ROLL BARS AND PLATES.

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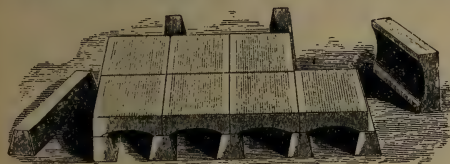
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Drainer Stones



The Klary and Snell Patent Drainer Stones are made of the most durable material, and are proof against acids or bleaching agents; smooth on both sides, and do not soil stock. Send for description and a list of Canadian and United States Mills using them.

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—By confining themselves to the making of paper making machines, the Beloit (Wis.) Iron Works turned out for the year ending October 1, 1903, nearly half a million dollars' worth, which includes \$60,000 worth shipped to the Thames Paper Company, England.

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Paper, Pulp and Sulphite Fibre Mills

Telegrams—"WOODPULP-LONDON." Estab. 1879

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Importers of Wood-Pulp, Boards, etc.

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HANSON'S WOOLEN MILL

Hull, Que.

Manufacturers of

Best Pulp Felts
in the World.

A writer in the Paper Maker, of London, apologizes for the mistake by which he made Capt. Partington say that the Cushing Sulphite Pulp Co.'s mill, at St. John, was closed down. It was the St. John Sulphite Pulp Co.'s mill, at Mispec, that was referred to by Capt. Partington. Regarding the Mispec mill, the same writer goes on to say: " candidly speaking, I think it is a great mistake to try to run a mill with the chief control and directorate nearly 3,000 miles away. In other words, the mill at Mispec has been run by directors in Scotland, and they have found out that it can't be done successfully that way."

CHINA CLAY **ROSIN,**

Best Paper
Makers' Strained

Bleaching Powder. Soda Ash.
Ultramarine Blue.

STARCHES—Highest Grade Pearl
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Handles all grades of Pulp and
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Branch Office,
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Importers of Belting, Hose, Mill Supplies. "Camel" Brand
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Sulphate Alumina

China Clay & Bleaching Powder
Ultramarine and
Aniline Blues



PULP WOOD BARKER

Sherbrooke Iron Works

SHERBROOKE, QUE.

MANUFACTURERS OF

Saw Mill and Wood Working
Machinery.

Wood Barker

with automatic block turning attachment.
Improved machinery for cutting pulp wood
to any length. | Improved

Pulp and Paper Screens.

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Dealers in all kinds Paperstock, Sizing, etc.

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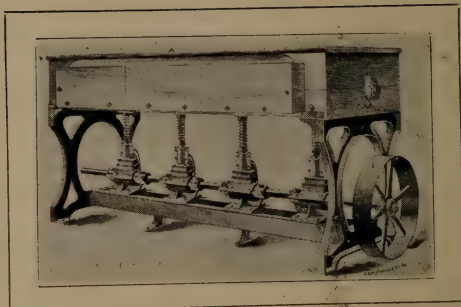
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10 OR 12
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SIZES

Rigid frame, lack of vibration, rapid and positive return of diaphragm rods, and ease of cleaning, are features of our screens.

—More details on request.—

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THE PULP AND PAPER MAGAZINE OF CANADA

VOL. 1.—NO. 8.

TORONTO, DECEMBER, 1903.

{ \$1 A YEAR.
SINGLE COPY 10c.

Pulp and Paper Magazine

A monthly magazine devoted to the interests of Canadian pulp and paper manufacturers and the paper trade. Issued between the 10th and 15th of each month.

SUBSCRIPTIONS: Canada, Great Britain and the United States, \$1 a year; to Foreign Countries, 5s. a year.

Changes of advertisements should be in the publishers' hands not later than the 1st of the month, and, where proofs are required, four days earlier. Cuts should be sent to the Toronto office, by mail, not by express.

BIGGAR-SAMUEL, LIMITED,
PUBLISHERS

8 Court St., TORONTO. Fraser Bldg., MONTREAL.

The present issue will close the first volume of the Pulp and Paper Magazine, so that future volumes will begin and end with the calendar year. We wish our readers a joyful Christmas, and thank our friends for the interest they have taken in our young magazine.



The United States pulp and paper manufacturers, if they cannot always look to Canada for their supplies of pulpwood and pulp, can turn with hope to their own Alaska. Behind the chain of mountains that are "parallel to the coast," and at a distance greater than three marine leagues from the same, also at a safe distance from Portland Channel or the guns of Port Simpson, there are plenty

of spruce and hemlock trees. F. J. Parke, a special agent of the Land Office, Washington, has been in Alaska nearly a year, and reports that there are immense tracts of pulpwood of the finest quality, with splendid waterpowers in almost every section of the country, and with easy access to river navigation. No doubt such tracts of pulpwood would serve to keep the paper mills of the Pacific coast running for an indefinite time, but they would hardly serve the purpose of mills in the South, Central and Eastern States, for neither pulp nor pulp wood could be profitably carried across the continent as a raw material for paper mills.



It is encouraging to learn that in Ontario, New Brunswick, Nova Scotia and British Columbia the importance of scientific forestry is beginning to be appreciated by Governments, as well as universities and people. In Quebec it is appreciated by an intelligent section of the people, if not by the Government. It is better understood now than ten years ago how many things essential to the future of the country hang upon the nurture and regulation of our forests. Our climate, our soil, and—still more

vital—the reservoirs of water in our lakes and rivers, upon which to a prodigious extent our water powers and manufacturing interests will depend in the future, all hinge upon the forests. The provincial press has taken the recent timber limit sales in Toronto as a text for sermons on the risks involved in selling off more Crown timber without more carefully studying the effects of such sales on the coming problem; while Toronto University now sees the need of carrying out the provision made some time ago for establishing a chair of forestry. At the sessions of the Experimental Union in connection with the Agricultural College at Guelph a few days ago the forestry problem in relation to agriculture was the most interesting question discussed, and so clearly have many Ontario farmers seen the relation of forestry to agriculture that they unanimously passed a resolution urging upon the Government the creation of a provincial school of forestry. The Toronto World suggests that some of the proceeds of the recent sale of timber limits be devoted to the needed chair of forestry in Toronto University. A department of forestry is to be added to McGill University and, as mentioned last month, instruction in forestry is to be one of the new features of the courses at Mount Allison University in New Brunswick. These are encouraging signs, but a campaign of education is needed to bring pressure to bear on Governments who, tempted by the ease with which revenue can be raised by selling timber lands, blind themselves to the wide-spread ruin they are bringing upon the agricultural and manufacturing interests of the future. More havoc can be caused by ten years of reckless forest destruction than can be remedied by a hundred years of pains-

taking afforestation. To show how this thing is working out before our eyes, we quote a paragraph from the report of Hon. George W. Stephens on the Crown lands management of Quebec: "There are sections of the Province where settlement has taken place on lands absolutely unfit for culture. Considerable portions of each lot have been cleared, farm buildings and parishes erected, and villages established. For a time the traffic in wood has enabled the inhabitants to live comfortably. The soil is now exhausted, barren sand has taken the place of the thin coating of productive soil which has been deposited by the decaying leaves through years of time. These farms are being abandoned. The forest, which really supported the inhabitants, has disappeared. The only alternative for the settler in such districts is emigration." The Commissioner adds that it is largely from this class that the United States derives its Canadian population in the New England States. We thus see what is happening at home while the forests of Quebec are being shipped to supply raw material for United States pulp and paper mills. After destroying the only thing of value on their own lands these self-impoorished men go to the States and seek work in mills whose existence is maintained—with the aid of the Quebec Government—by the ravaging of more Quebec forests, and thus the process of impoverishment is going on through the Province.



LITERARY NOTES.

"The Sampling of Wood Pulp" is a 14-page pamphlet by R. W. Sindal, analyst for Edward Lloyd, Ltd., Daily Chronicle paper mills, Sittingbourne Kent, Eng.; price two shillings. Various

methods of testing pulp for moisture are explained with diagrams. The methods here put forward are probably as good as any in use, but it must strike those who read this pamphlet and other treatises on the same subject that all processes of testing are faulty at some point, and none has yet been presented that combines simplicity with exactness.

Owing to the closing of the New York State College of Forestry the Forestry Quarterly will now be carried on as an independent publication, representing the profession at large in the United States. The November issue begins the second volume of the new series, and one of the useful features will be a department containing a summary of current literature, home and foreign, dealing with forestry. This issue mentions that a forestry department has been started in the University of Michigan, one in Harvard University and one in the University of Maine. It is also stated that the Yale Forest School has sixty-four students. This instructive quarterly is published at Ithaca, N.Y., and the subscription is \$1.

The report of the fourth annual meeting of the Canadian Forestry Association, held last March at Ottawa, has been published, and makes a pamphlet of 119 pages. A portrait of Wm. Little, of Westmount, Que., honorary president, appears as the frontispiece. In addition to the report of the directors and the discussions, the report contains several papers, among which is one by His Honor J. B. Snowball, Lieutenant-Governor of New Brunswick, on the forests of New Brunswick; one on forestry and lumbering in western Nova Scotia, by F. C. Whitman, Annapolis Royal; on forest fires, by W. A. Hendry, late Deputy Commissioner of Crown Lands of Nova Scotia; a sketch of the fire ranging system in Ontario, by Aubrey White, Deputy Commissioner of Crown Lands of Ontario; Forestry Work in Manitoba, by A. P. Stevenson, Nelson, Man.; Forest Trees in the Arboretum at the Experimental Farm, Ottawa, by W. T. Macoun; Forest Protection in the Railway Belt of British Columbia, by James Leamy, Dominion Crown timber

agent, New Westminster, B.C.; Forestry Education in Canada, by Prof. W. L. Goodwin, Queen's University, Kingston; on the Effect on Fish Life of Sawdust in Rivers, by Prof. A. P. Knight, Queen's University; the Timber of Canada, by Hon. J. K. Ward, Montreal. There is also a review of the forest fires of 1902, prepared by a committee of the association. The chief officers of the association for the year are: Hiram Robinson, president, Ottawa; Aubrey White, vice-president, Toronto; E. Stewart, secretary, Ottawa, and R. H. Campbell, treasurer, Ottawa. The membership fee is \$1, and there are now nearly 400 members. The next annual meeting will be held in Toronto on Thursday and Friday, 10th and 11th March, 1904.



NEW COMPANIES

La Compagnie de Publication Le Soleil (Limited); capital, \$125,000; headquarters, city of Quebec; to publish newspapers or other publications. The Hon. C. A. P. Pelletier, K.C.M.G., R. LaRue, W. Power, L. P. Sirois, C. F. Delage, all of the city of Quebec.

The Slated Relief Map Company, Limited; capital, \$40,000. To purchase from A. B. Shantz his secret process of manufacturing slated relief maps; to print, publish and manufacture maps and charts, school and office supplies, books, papers and periodicals. W. Scott, R. W. Doan, M. Moyer, A. B. Shantz and L. J. Clark, all of Toronto.

The Crown Lumber Company, Limited; capital, \$40,000. To deal in lumber and all the products thereof; also to purchase and sell timber lands. B. W. Yates and W. E. Duffus, of Detroit; H. B. Yates, of Montreal; A. J. Wilkes, of Brantford; R. W. McPherson, of Thamesville, Ont.

The Gilmour Door Company, Limited. Capital, \$100,000. To manufacture and deal in lumber, pulp, paper, doors, and all articles into the manufacture of which wood, paper or strawboard enters. D. Gilmour and R. Weddell, of Trenton, Ont.; the Hon. S. H. Blake, E. W. McNeill and R. Gowans, of Toronto.

The Van Buren Lumber Company, Limited. Capital, \$24,000. To carry on a general lumber and milling business in all its branches, including manufacturing and dealing in all kinds of timber, manufactured and unmanufactured, and all products and by-products thereof. T. J. Cochran, J. M. Stevens and A. Lawson, all of Edmundston, N.B., and J. W. Hammond, of Van Buren, Me.

The Westmount Advertiser Company, Limited. Capital, \$10,000. To print, publish and sell newspapers, journals, books, etc. W. Smith, of Montreal; F. Gilbert, C. Stevens, D. Cameron and D. Ross, of Westmount, Que.

The Keystone Press Company, Limited. Capital, \$50,000. To carry on the business of newspaper and magazine publishers, etc. Headquarters, Victoria, B.C.

Arbuthnot & MacMillan, Limited, Toronto. Capital, \$40,000. To manufacture and deal in all kinds of printing, printed matter, paper, etc. W. Henderson, L. S. Haynes, T. Arbuthnot, J. A. MacMillan, T. Cairns, H. E. Stevenson and R. C. Tibb, of Toronto.



PULP MILLS OF THE MARITIME PROVINCES.

Editor, Pulp and Paper Magazine:—

Sir,—Considerable comment has been made by the papers over the border, on the number of pulp mills that have failed in the last few years in the Maritime Provinces, and as an erroneous impression may have been created that those provinces of the Dominion are not so suitable as the other provinces for the manufacture of paper pulp, I desire to correct any such impression, for, if thorough investigation had been made into the suitability of the places, before installing the mills, and other conditions hereafter alluded to had been looked after, there would have not been so many failures.

The pulp business in Canada is comparatively a new industry, and such industries are always subject to vicissitudes which will be overcome in time, a proof

of which is shown by the immense amount of capital which was expended in such mills in the United States, before they were brought to their present state of efficiency; failures and losses of capital were numerous, but now, after twenty years' experience the industry is on a solid basis.

For the successful operation of pulp mills, certain conditions are essential, though in all cases not absolutely necessary, as it would be very difficult to fulfil all these conditions, but the nearer they approach to the ideal the more chance the mill has of being successful.

CONDITIONS FOR GROUND WOOD OR MECHANICAL PULP MILLS.

Ample and steady waterpower.

Sufficient wood lands to supply the mill for at least 25 years with pulpwood.

Good facilities for getting the wood to the mill.

Good shipping facilities all the year.

Experienced management.

CONDITIONS FOR SODA OR SULPHITE PULP MILLS.

Sufficient wood lands to supply the mill for at least twenty-five years with pulpwood.

Cheap coal.

Good water.

Good facilities for getting the wood to the mill.

Good shipping facilities all the year.
Expert superintendence.

The following is a list of the pulp mills in the Maritime Provinces:

Shut down

or in

liquidation. Working.

Acadia P. & P. Co.	3	..
Nova Scotia Pulp Co. . . .		I
St. John Sulphite Pulp Co. I		..
Sissiboo Pulp Co.	2	..
Dominion Pulp Co.		1
Cushing Sulphite Pulp Co. ..		I
Maritime Sulphite F. Co. I		..
St George Pulp Co.	I	I

In the case of a number of these mills the wood supply has been the primary cause of failure, the price having a

anced 100 per cent. in a few years, on account, principally, of the mills not owning sufficient wood lands to make their own wood, and so keep down the price of that which they had to purchase. Certainly, the labor item in making the pulpwood has increased somewhat, but this would only account for a small proportion of the advance in cost. Also, probably, the cost of getting the pulpwood to the mills has been high. I have known a case where it cost over one dollar to drive a cord of pulpwood twelve miles on a rough river. In one case the difficulty was in the engineering department, and the loss was heavy. Besides, it had to contend with other disadvantages.

Although most of the mills are at tide water, some of them are disadvantageously situated by having to tranship the pulp twice before it arrives at the steamer or railway. Another serious item was the want of expert knowledge in the management, as instanced by the numerous changes that have been made from time to time in the personnel of the managements.

Many of the mills have been at a disadvantage on account of the unequal water supply for power, the streams being small, and have often had to run only a portion of the machinery. The quality of the water has also been a serious factor in one case. In this connection, I may say that, of the large number of pulp mills that have been projected in the Maritime Provinces in the last five years, only a very small percentage have started work, and the locations are now being used largely to prepare pulpwood for the United States.

Half of these mills are either chiefly owned in Great Britain or have floated their debentures there, and these failures have already caused a cautious feeling there in respect of new enterprises here in this industry.

If English investors would employ capable and disinterested Canadians, who know the country and its customs, to look into such propositions, there would be less of such troubles, but when large concerns, such as Edward Lloyd, Limited, send their own manager out here

to look into propositions submitted to them, they are liable, not knowing the conditions of the country, to make serious mistakes, as in the Sturgeon Falls matter, where they had to pay for their experience pretty heavily.

EARNSHAW BRADLEY, C.E.

Toronto, 14th Dec., 1903.



The completion of the International Railway, and the Duluth, and Rainy Lake road is assured, which with the Backus syndicate and other industries will make Fort Frances and International Falls the twin cities of the north.



THE INAUGURATION OF THE NEW PULP MILLS AT CHICOUTIMI, QUE.

The town of Chicoutimi, Que., was en fete on November 28th in honor of the inauguration and blessing of the new addition to the pulp mills just completed by the Chicoutimi Pulp Company, the proprietors of one of the largest pulp mills in the world. The occasion was observed with civic honors and religious ceremony to celebrate the opening of a new epoch in the history of Chicoutimi, which is destined to play an important part in the development of the northern centres of the Province. The day was observed as a public holiday. Every house in Chicoutimi was decorated with flags or bunting in honor of the event. A high pontifical mass was celebrated in the church in the forenoon, and the blessing of the mill took place at 2.30. Fully 3,000 persons attended the benediction of the mills. At 2.30 the machinery was stopped, and the Rev. F. X. Belley, Vicar-General, who officiated in the absence of the bishop, appeared surpliced, accompanied by a number of the clergy from the college, while cures of adjoining parishes appeared in the centre of the building. Rev. Father Belley delivered a short address, stating the object of the occasion, which was to invoke God's blessing upon the enterprise to avoid the cause of accidents, and at the same time bless everyone connected with the works. He also addressed a few re-

marks to the workmen, whom he beseeched ever to be loyal to their work and their masters, and to avoid strikes, etc. Father Belley then pronounced the benediction, which was followed by the choir singing, which closed the ceremony. The mill was then started, and an exhibition given of its working. At a word of command every employee sprang to his respective station, and at a signal every necessary valve was open and the machinery in motion. The guests, in company with J. G. Scott, manager, and A. E. Doucet, C.E., chief engineer of the Quebec and Lake St. John Railway, made a tour of inspection through the premises. The new mill, which stands about 300 yards from the older structure, higher up the river, is constructed of iron laid into solid masonry work.

The property of the Chicoutimi Pulp Company is valued at \$1,500,000. The new mill just completed cost \$600,000, half of which went for machinery. The contract was carried out by Emile Cote, of Quebec. The iron structural work was done by the Phoenix Bridge Co., of Phoenixville, Pa., and the Dominion Bridge Co. The walls were built by C. Johnson, the Niagara Falls contractor, and the Wm. Hamilton Manufacturing Co., Peterborough, Ont., and Pusey & Jones Co., of Wilmington, Del., each put in ten grinders at \$1,200 apiece. S. Morgan Smith & Co., of York, Pa., supplied the turbines for \$40,000. Baker & Shelin, of Saratoga Springs, the rotary screens. The shaking screens were made by Yansen & Dahl, Christiania, Norway, and the diaphragm screens, forty in number, by the Waterous Engine Works Co., of Brantford, Ont. The wood preparing plant, boilers and hydraulic presses were supplied by Boomer Bros. & Co., Syracuse, N.Y. The shafting and pulleys, the largest ever made in Canada, came from the well-known Levis works of Carrier, Laine & Co., and the pumps from the Dean Pump Co., of Holyoke. The two pulp mills have thirty grinders, and consume 3,000 twelve foot logs per twenty-four hours. They turn out nearly 190 tons wet and 90 tons

dry pulp per day. Six hundred hands are employed.

The town of Chicoutimi has a population of six thousand, who are principally engaged in the pulp trade, which furnishes employment to five hundred men, and, through them, sustains many of the other industries of the place. It is situated sixty-eight miles from the mouth of the Saguenay, which takes its rise where the surplus waters of the Lake St. John are poured into the awful chasm rent in the Laurentian mountains by some violent convulsion of nature. The town is reached in the summer by boat as well as by the Quebec and Lake St. John Railway.

In the evening a banquet was tendered by the mayor, councillors and citizens of Chicoutimi to the president and directors at the Chateau Saguenay, at which 175 guests were present. Hon. N. Garneau, the president, in reply to a toast, referred to the battles fought and won to accomplish the present result, and gave an account of the general situation of Chicoutimi district from an industrial point of view, alluding also to the wealth of water power and commercial value of the forests of the district. He included pulp wood, which, he said, was most susceptible to great development, provided that the proper means for facilitating transportation of the product was encouraged. He pointed out that private capital has done its share. There was nearly \$3,000,000 invested in the municipality of Chicoutimi, and fully \$4,000,000 in the district, which gave employment to some 1,500 men in summer and 4,000 in winter. The deepening of the Saguenay to Chicoutimi was necessary, and afterwards the proper equipment of it as a port for ocean vessels. If this great public work was carried out, Chicoutimi would not only become an important point of shipment, but would enhance the value of the district, that could furnish 200,000 tons of ocean freight during a season.

The company held its annual meeting on the same day, at which the old board was re-elected, viz.: President, Hon. N. Garneau; vice-president, Mr. J. D.

uay; board of directors, Hon. V. W. Arue, N.P., C.L.M., Dr. J. A. Couture, S.S., G. Lemoine, Quebec; F. X. Goselin and J. E. A. Dubuc, managing rectors, Chicoutimi.



BRITISH WOOD PULP ASSOCIATION.

The seventh annual meeting of this association was held in Manchester on November 19th. H. B. Wood, chairman of the Executive Committee, presided in the absence of the president, Captain Partington.

In the committee's report a reference was made to possible fiscal changes. Counsel's opinion had been obtained to the effect that it would be expedient to put into the standard contract the following clause: "All duties, if any, levied on wood pulp sold under this contract to be payable by the purchaser."

The recommendation of the executive that a joint committee representing the Paper Makers' and British Wood Pulp associations be formed to appoint a sole arbitrator to settle any dispute connected with the trade was adopted. The committee will consist of four members appointed by each association. A resolution to form a joint committee of the Paper Makers' Association, the Scandinavian associations, and the British Wood Pulp Association, to draw up and adopt a uniform scheme for sampling and testing pulp for moisture, was also adopted. It was decided that the Executive Committee meet in future at the London Chambers of Commerce, and also that no two members of one firm should serve on that committee. The following officers were elected: President, E. Partington; vice-presidents, F. Lloyd, A. E. Reed, C. D. Ekman, C. T. Owen, C. T. Craig, W. G. Taylor and L. P. Andrews; honorary secretary, F. E. R. Becker; honorary treasurer C. F. Douch; Executive Committee, Messrs. Henderson, Paris, Wood, Nordberg, Mather, D'Oyley Mears, Andrews, and Lewis Clegg.

At the annual dinner Joseph Dixon, in proposing "The Wood Pulp Trade," referred to the year 1880, when pulp in

Norway and Sweden was five guineas (\$25.57) a ton. To-day he did not know what it was, but it was jolly cheap all round. He accorded the pulp industry the praise for having brought forth a fibre and pulp that could supply the wants of the country at the price it was being supplied at to-day. It had been his privilege during the last few months to visit our granddaughter—Canada—and to investigate the conditions prevailing over there in the wood pulp industry, and he was quite certain that they had now got a competitor in the future with whom they would have to reckon. He believed they would have to put their house in order in Scandinavia if they wanted to keep up with the great sister colony of Canada, and why ought they not as Englishmen to give preference to Canada? (Cheers.) Canada was developing into a great nation. She was "a daughter in her mother's house, but mistress in her own," and he hoped and trusted that the alterations that were going to be made in the fiscal policy of the country would develop the resources of Canada, and at the same time develop the papermaking industry in England. Was it not better that a ship should bring two tons of pulp from Canada than one ton of paper? Did not that mean that the shipping industry in this country would develop twofold? There was just one little rift in the lute, he did not mind telling them. He had visited some of the finest developments and works that he had ever seen in the wood pulp industry, in Canada, but unfortunately those great works were over-capitalized, and he did not believe they brought any profits whatever to the shareholders. But that was entirely by the way. Those engaged in the paper industry in England just now were enjoying a little prosperity, and surely they were entitled to an occasional innings, and no one would begrudge it. He did not mind telling them frankly that for thirty-three years he had been making paper in England, and he could assure them that if his balance sheets were examined quite 30 per cent. of them would show no dividend whatever. But that did not matter; he was getting it now.

—A large manufacturing firm, in Leeds, England, would like to get the name of a Canadian paper mill making a class of paper suitable for card index systems. A sample of the kind of paper required can be seen at the office of the Pulp and Paper Magazine. Here is an opportunity for introducing a new line of goods into the British market.



—The affairs of the Consolidated Lake Superior Co., owners of the Sault industries, including the pulp mills, are not yet settled. Senator Dandurand, who

went to England on a mission for money, has returned, and gives out the statement that English capitalists are willing to advance money to put the various industries on a working footing if the Speyer & Co.'s loan is



F. H. Clergue.

settled; but as Speyer & Co.'s claims cannot be disposed of except by private agreement or by prolonged litigation in the United States courts, this capital is not likely to be forthcoming. Meantime negotiations are being carried on with Cincinnati capitalists, but no result is announced. It is stated that Speyer & Co. are prepared to submit to the Ontario Government proposals for reorganization on condition that law processes be dropped, but they decline to negotiate with Mr. Clergue.



—Reference was made last month to the suggestion by J. R. Walker, of Montreal, that a commission should be created having power to determine causes arising out of the regulation of rivers and streams, and dealing with forestry matters which affect the flow of waters. Mr. Walker points out that already the

pine has been cleared away from the country around the head waters of most of the rivers which take their rise in the Laurentian mountains and fall into the St. Lawrence; and that the lumbering now carried on there is mostly for the remaining timber, chiefly spruce. Seeing the rapidity with which pulp manufacturing consumes spruce, it will be but a short time before the hills which form the sources of these rivers are stripped bare, and then the wasting away of the surface soil will leave this region a mere mountain waste, subject to alternations of drought and flood, as has already actually occurred in the Allegheny region of the United States. In fact, the drought of last spring, followed by the dry spell of the autumn, which has left the pulp makers of the Eastern Townships of Quebec without enough water to run their mills, is very probably the beginning of climatic changes brought about by forest stripping, which may bring disaster to both the agricultural and manufacturing interests of the whole St. Lawrence valley. Such a calamity can be averted by the timely adoption of a broad policy of forest preservation and the regulation of the water supply of rivers and streams so that the interests of manufacturers using power are protected. As will be seen elsewhere, the recommendations of Hon. Geo. W. Stephens, the special commissioner on Crown lands and forestry in Quebec, are on the same lines, and it is to be hoped that these disinterested counsels will prevail with the Provincial Government. Had the Quebec Government of twenty years ago realized the future of pulp, the Province of Quebec would to-day be exporting paper and pulp to every quarter of the globe instead of merely furnishing the raw material for other countries to do the trade and make the profit.



—At a recent meeting of the Scandinavian Wood Pulp Association it was resolved to start a Norwegian-Swedish sales office for mechanical pulp at Christiania.

THE MANUFACTURE OF "NEWS."

(Concluded from last issue.)

Without going into all the complicated chemical changes that take place when alum cake is added to the beater, involving the precipitation of the rosin from the soda solution, certain reactions between alum and hard water, and coloring matters, and so on, we may merely give an approximate estimate as to the actual loss in weight due to these changes. The total weight of alum cake, rosin, and alkali, added as per the schedule given in Chapter I, amounted to $2\frac{1}{2}$ tons. Of this we may estimate that about 16 to 20 cwt. are lost by reason of the solubility of the substances in water.

We may next turn our attention to the other side of the balance-sheet, and endeavor to make up a list of items to account for the total weight of materials used as appearing on the debit side of the account.

(1) The Paper.—It is well known that the paper, as leaving the calenders and going on to the reelers is very dry, containing a small proportion of water. Now, in making comparison of the raw materials and the finished product the conditions must be similar. In general terms, the paper is a mixture of the pulps and the clay. The pulps and clay have already been expressed in such weights as to represent raw materials having a ten per cent. allowance of atmospheric moisture. Hence we must determine exactly the amount of moisture in the finished paper and then see what shortage of weight is due to the over-drying of the paper. Suppose, for the sake of example, that the weight of paper made is exactly 100 tons.

On testing the paper for natural moisture, which is easily done by taking sheets out when the reels are changed on the machine, we may find that the total moisture is only 5 per cent. Clearly, we cannot compare the weight of the paper with the weight of pulp until we know what the paper would weigh if it contained exactly 10 per cent. of mois-

ture. This is done in the following manner: 100 tons of paper with 5 per cent of moisture is equal to 95 tons of bone-dry paper. Since 90 parts of bone-dry are to be equal to 100 parts of air-dry (i.e., to give a paper containing 10 per cent. of moisture), 95 tons of bone-dry paper will give 105 tons 11 cwt. of paper containing 10 per cent. of moisture. Hence, the allowance to be given for this loss is:

105. 11. 0. less 100. 0. 0. 0. or 5 11. 0. 0. This has to be placed on the credit side of the account.

(2) Broken Paper.—If any dry broken is left at the end of a trial it must be weighed, and duly recorded. Any wet broken is also weighed, tested, and noted down in terms of dry paper.

Suppose the weight is 1. 5. 0. 0.

(3) Back Water Residues.—If these have not all been used up in the making of the paper, they should be weighed up and allowed for. In our imaginary case we may take this as being $1\frac{1}{2}$ tons.

The Water Used.—This is an important item, though, owing to the nature of the changes, the influence on the final weights is practically nothing. A short discussion of the matter, however, will be useful. The amount of water required per ton of paper is a very variable item. Some mills will only use a small proportion, while others may find it necessary to use large excesses, thus needing an elaborate plant for treating the back water residues. This excess is mainly due to the fact that in many cases paper-makers use large quantities of water for keeping down froth, for the suction boxes, for washing the wires, and in other directions of the machine. The less water that can be used in this way the better, as then the need of treating the residues may be dispensed with. The writer is convinced that a system of back water treatment is possible in which the amount of surplus water left after the removal of the residues becomes almost nothing. In fact, experiments have been made by the writer proving that the amount of fresh water used on the machine may be reduced to such an extent that no surplus water need be produced.

or, in any case, only a very small amount. However, this is not the case in present practice so that we must endeavor to determine the water which goes away after treatment.

The water that runs away from the settling plant, or from the apparatus used for recovering the residues, can actually be measured or approximated. We give a method for doing this.

Keep a record of the air-dry weight of residues obtained. In the case of filter presses it is merely necessary to count the number of cakes, and dry out a few to find the average dry weight. Several times in the day take a sample of the back water running into the tanks. Determine the weight of residue in half a gallon of this water. Make several tests in order to get a safe average.

Here is an example:

Weight of dry residues total 5 tons.

Weight of dry residue in one gallon (average), 0.015 lb.

Total number of gallons run from the settling plant.

Of course, the measurement of the back waters is not a difficult matter under ordinary circumstances; but, in the absence of any actual definite measuring, the above scheme is a good one to adopt.

Now in this surplus back water discharged into the drain because there is no use for it, there will be a certain proportion of suspended matter which cannot be removed by the process of settling, or, indeed, by any other method without great expense. The amount will depend upon the completeness of the treatment. If, for example, the quantity is still $\frac{1}{2}$ lb. per 1,000 gallons, then the total amount lost in this way will be $(750 \times \frac{1}{2})$ lb., that is, nearly 3 cwt. This small amount will be placed to the credit side of the balance sheet.

A careful examination of the soluble matter in the 750,000 gallons of water will show that the weight per gallon is considerably higher than the amount of dissolved solids in the fresh water. Thus, in one exhaustive trial of this kind made by the writer, when studying this

question of yield along the lines of this paper, the following results were obtained. Expressing the quantities in terms of the weight of solid matter per 1,000 gallons of water:

In the fresh water used, 3.7 lb. per 1,000 gallons.

In the back water obtained, 7.5 lb. per 1,000 gallons.

In the former, the dissolved matter was chiefly salts of lime from the hardness of the water. In the latter, the nature of the dissolved substances was entirely different; but into these we need not enter at the moment. It is sufficient to point out that the water carries away a certain weight of matter derived from the materials used in the manufacture of the paper. If we put this as the quantity found in the above test we have (750×3.8) lb., or approximately

1 ton, 5 cwt. 2 qrs. 0 lb.

It is interesting to compare this figure with the figures showing the loss by the solubility of the sizing substances and alum.

Continuing the subject of the water used, we may notice that the soluble matter in the water is not all lost, only that which goes away from the settling tanks or recovery plant. Some of the soluble constituents remain in the paper, owing to the fact that the wet paper from the press rolls is dried on the cylinders, and thus some quantity is retained. The amount is easily determined. A few tests for the moisture in the wet paper just before it goes on to the drying cylinders are required, and the amount of water evaporated by the cylinders is to be calculated. Suppose the condition of the paper at this stage is:

Total moisture 70 per cent.

Bone-dry paper 30 per cent.

Since the weight of paper made was 100 tons corresponding to 95 tons bone-dry, we have total weight of wet paper:

$$\begin{array}{r} x \quad 30 \\ - = - \\ 95 \quad 100 \end{array}$$

in which x is 317 tons. The actual weight of the water evaporated is thus $(317 - 100)$ tons, or 217 tons. This cor-

responds to 217 x 2,240 lb. of water, or 48,608 gallons.

Now, this 48,608 gallons will contain, in the case quoted, 184 lb. of substances due to soluble constituents derived from the alum, soda, and the pulps. The amount is too small to be reckoned in the schedule of the items on the credit side of the sheet; but we merely point this out as one of the results of the various chemical changes going on even with the manufacture of simple "news." The exact changes can only be set out and accounted for by a proper analysis of the constituents of the paper, other than fibre, together with a knowledge of the nature of the water used.

We are now in a position to construct the balance sheet for the materials and product. On the one side we have the slightly amended schedule of raw materials:

Raw Materials.	Tons.	Cwt.	Qrs.	Lb.
Mechanical pulp.	70	0	0	0
Sulphite pulp ...	30	0	0	0
Additional pulp				
found by test ..	0	0	0	0
China clay	9	0	0	0
Alum cake	1	15	0	0
Rosin	0	12	0	0
Alkali	0	3	0	0
	III	10	0	0

On the other side we have a scheme something after the following:

	Tons.	Cwt.	Qrs.	Lb.
Weight of finished paper (5 per cent. moisture)	100	0	0	0
Allowance for weight of moisture necessary to make the finished paper show 10 per cent. moisture.	5	11	0	0
Allowance for wrapping and excess moisture in mechanical pulp	1	5	0	0
Allowance for ex-				

cess moisture in the clay....	—	5	1	16
Losses due to the sizing process	1	1	0	0
Weight of dry broken paper, over	1	5	0	0
Weight of dry residues from recovery plant.	1	10	0	0
Residues still in the water, leaving the settling tank after treatment	0	3	0	0
Floor sweepings (pulp wasted in opening bales, etc.)	0	0	0	0
Total accounted for	III	0	1	16

We do not claim that these results set out in this scheme are those that will be found in any particular instance. The schedule is given merely to indicate the methods by which it may be possible for the paper-maker to account for the losses in manufacture. It is evident that the most serious loss is that due to the over-dried condition of the paper, and thus the scheme will serve a useful purpose in indicating the extremes of loss that one would expect.

For this reason, it would scarcely be possible to carry the discussion further with a view of studying the method in which the actual yield is expressed by most paper-makers. Some give the yield in terms of the weight of finished paper made from the pulps used, and consider the weight of clay added as a set-off against mechanical losses and the loss due to the over-drying of the paper. In the case given, this would be expressed as being a yield of ton for ton, or that a ton of paper took 20 cwt. of material.

Others include the clay, and so show a smaller yield of paper. Whatever method is used, the adoption of a scheme like the one suggested would be of great value, as showing the paper-maker what the conditions obtaining in the mill are

likely to produce. We are of the opinion that a test of each machine in the mill lasting a sufficiently long period—say, for a week, or, at any rate, three or four days—would prove of immense service. The losses are at present too often put down to mechanical cause without proper investigation; or, on the other hand, a good yield is regarded as an instance of good work, whereas it may be due to the very prosaic existence of a generous allowance of pulp beyond the amount actually booked to the machine.

The institution of a few important tests of this kind would serve to establish the conditions necessary for a normal yield. Once these conditions are properly established, any serious deviation from the expected yields may then be regarded as a proper cause for complaint; but without them the subject is more or less a matter of guess-work. The suggestions may not be of service to those mills in which the yield is already a high one, and there are no doubt many mills in which such is the case, and probably this may be traced to the excellence of the arrangements for such matters as the testing of the wood pulp, the treatment of the back water, and the prevention of the froth. These are serious causes of leakage in many instances, and ones that may be more easily detected than leakages of stuff through defective valves, and pipes that cannot be easily got at.

The explanations given seem to indicate that, with the pulp properly tested and weighed out, and with the clay in normal condition, the losses after that may be simply mechanical, and, therefore, to a large extent, preventable. We have not touched upon all the sources of loss even now in the schedule, as, for instance, the loss due to waste of pulp in opening up the bales, which is generally swept up, and either thrown away or used in some other direction.—Paper Maker.



During the last few weeks hundreds of cords of pulp wood have been received at Booth's new pulp mill, Ottawa.

BRITISH PAPER TRADE SITUATION.

(From the World's Paper Trade Review)

In considering the subject of fiscal revision, it behoves every man to learn what is the exact position of the trades most nearly affecting his own interests under the present system of free imports. The man who decides the question solely from the point of view of his own local or personal interests is unworthy of the privileges of a vote-recording citizen, and has much to learn before he becomes a politician. The whole strife for it, and the mere striving raises must be scanned before judgment be pronounced, and motives of personal gain should not cloud the issue. This is the ideal conception of public duty to which few men attain. We may all strive for it, and the mere striving raises the judgment above the mere sordid. But no one can ignore the aspect of the question which most nearly concerns himself, and in all cases it forms a good starting point for an examination of the complexity in which the whole question is wrapped. We therefore set out to show our readers what is revealed in recently published statistics regarding the paper trade of the country. We would state facts rather than deduce lessons from them. The latter task may be left to the reader.

The expansion of the trade is indicated by those figures in the census which give the number of people engaged in paper consuming crafts. The record of employees of the printing and bookbinding trades in England and Wales during the last half century is as follows:

1851	32,995
1861	46,576
1871	64,226
1881	88,108
1891	121,913
1901	149,793

In the whole range of our industries, there is not one which has been the subject of such a rate of increase. There has been multiplication by almost five within fifty years. Even this is no ac-

curate measure of the increase in the consumption of paper, because the machinery now at command has increased the capacity to use paper without increasing in anything like equal degree the manual labor necessary. Truly of the making of books there is no end.

The veriest tyro—the man in the street—knows that the output of the paper manufacturing trade of Great Britain has not kept pace with the expansion of the absorbing home market, but it is not generally known to what extent the foreigner is now supplying this market with the product of foreign paper mills. Half a century ago, when there was an excise duty of 1½d. a pound on British-made paper, the public records kept a note of the amount of paper manufactured. For instance, we find that in 1858 duty was paid upon 187,414,667 pounds, avoirdupois, or 83,667 tons. This was considered marvelous, and indeed it was, for it represented an increase of 200 per cent. over twenty-five years before, thanks to improvements in papermaking machinery.

But we shall not look back into ancient history in an investigation of the paper trade. Our concern lies with the present, and if we compare the imports of papermaking materials for 1902 and those for 1890, twelve years before, we shall throw some light upon the progress of our paper mills. The records of value are as follows:

Imports of Papermaking Materials.

1890.	1902.
£2,462,056	£3,386,713
Movement +38%.	

We have here an increase of nearly 40 per cent., which would be satisfactory if we did not know that the consuming industries had expanded their capacity for paper to a much greater degree.

If we look at the imports of finished paper, we learn to what extent the country is dependent upon foreign paper mills. Here are the import figures of all kinds of manufactured paper for the same two years:

Total Paper Imports.	1890.	1902.
	£1,976,894	£4,537,674
	+130%.	

The proof is convincing. We have over two and a half million pounds' worth of paper entering Great Britain annually, more than came into the country twelve years ago.

We may venture a little way into details, and find in what classes of paper the imports have increased, and from what producing sources the chief increases have come. The principal department is that of printing and writing papers, in which the increase has been stupendous and portentous. We append the figures:

Imports of Printing and Writing Paper.	1890.	1902.
	£389,105	£3,039,615
Movement +681%.		

In the latter year scarcely one-fourth of the whole value imported was on reels, and fully three-fourths in sheets. Of the former class, Sweden and Norway contributed 18,000 and 16,000 tons, respectively, valued at £220,000 and £204,000, and the United States came third with 10,000 tons to the value of £122,000. Contributions by other foreign countries were unimportant. The only British colony with any share of our imports of reeled printing paper was Canada with a bill for £66,000. The importance of the countries supplying this market with printing paper not on reels indicates a different order. The 1902 total value in this class was £2,300,299, and the contributors were Holland, Belgium and Germany (which we consider one exporting entity so mixed up are German exports with those of Holland and Belgium, owing to German manufacturers sending shipments through the ports of Rotterdam and Antwerp), Sweden, Norway, France, United States and Russia, the order of importance being as named.

It is, therefore, evident that our paper imports have been increasing at an enormous rate, and the question obtrudes whether our papermaking industry is in a state of decline—relative if not actual. There can be no question but it is. If it could be shown that our exports of paper had been increasing in any degree proportionate to our im-

ports, it might be argued that there were some classes of paper in which we were maintaining or acquiring a pre-eminence and others in which we were allowing the foreign mills to lead the van. We are, however, denied the satisfaction of any such consolation.

Total Paper Exports.

1890.	1902.
£1,679,000	£1,672,000

Movement — .5%.

The situation is one of "as you were" — absolutely stationary. And during these years, as before stated, the foreign increase in the British market has been one of 130 per cent., and the specific increase over two and a half millions of pounds. Twelve years ago our imports of manufactured paper were only slightly in excess of our exports of the same, and last year's value of imports was almost three times the value of the exports.

We may dissect the exports somewhat to find what over-sea markets are of importance to our paper exporters. In many departments of the export field, purchases by foreign countries show a tendency to decrease and those by British Colonies exhibit progress. It is not so in the paper trade, as the figures show:—

British Exports of Paper.

1890.	1902.	Movement.
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To Foreign

Countries .. £511,000 £587,000 +15%

To British

Colonies ... 1,168,000 1,085,000 — 7%

The Colonial market is worth almost twice as much as the foreign market, but the tendency is against the maintenance of this position. If present movements continue we shall witness a turning of the tables. A descent into further details may be instructive:

Exports of Writing and Printing Paper and Envelopes.

1890.	1902.	Movement.
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For Foreign

Countries .. £304,662 £368,325 +21%

For British

Colonies ... 892,186 753,964 —14%

The tendency of the total figures is echoed and accentuated. Here the colonial trade is worth more than twice the foreign trade. Among foreign nations, the purchasers in the order of importance are France, Germany, Holland and Belgium (these three considered as one), Japan, United States, China, Argentine Republic and Chili. Australia is the best of our colonial customers and South Africa follows. Canada, on account of paper being made within her borders and of her proximity to United States mills, does not take the position warranted by her importance.

The records of the export trade in paperhangings show slight increases in both the foreign and the colonial sections, although the former is the greater:

Exports of Paperhangings.

1890.	1902.	Movement.
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To Foreign

Countries .. £61,192 £79,581 +30%

To British

Colonies, ... 98,324 114,437 +16%

Even here the colonial trade exceeds in value the foreign trade by about 50 per cent. Evidently the formation of the wall paper trust in this country has had no detrimental effect on the export trade, although we believe that the prices charged in the home market, which were increased under amalgamation, are maintained in the foreign and colonial fields. The United States is the largest buyer of our wall-paper among foreign countries, although her purchases came to only £22,000 last year. The combined purchases of Germany, Belgium, and Holland are greater than those of the United States, but in considering exports to these countries the reasons which cause us to group them in their own export trade do not hold the same force. All British colonies are good customers for British paperhangings. Canada hangs back because she herself makes wall-paper, and has got to the point of exporting.

In the section comprised under the heading, "Pasteboard and Millboard," and which includes playing cards, the increase is shifted from foreign to colonial shoulders. Here are the amounts:—

Exports of Pasteboard and Millboard.

	1890.	1902.	Move- ment.
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To Foreign

Countries ..	£13,457	£15,790	+17%
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To British

Colonies ...	35,978	52,789	+47%
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The smallness of the specific increases diminish the satisfaction caused by the large percentage increase. Too often in investigating trade we find that the foreigner is increasing his hold of our trade by forced marches, while the cases of increase by our makers in foreign markets are, where they appear, usually in the nature of a crawl.

In paper not included in above classifications, foreign trade has witnessed a small decrease, while the colonial record proves modest progress. We give the figures, which include paper bags:—

Other Kinds of Paper, etc.

	1890.	1902.	Move- ment.
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To Foreign

Countries ..	£131,907	£123,581	— 6%
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To British

Colonies ...	141,265	164,237	+16%
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It is noticeable that the total quantity of paper bags sent to foreign countries in 1902 was only 20 tons, and the value under £500. The colonies took 1,375 tons, valued at £27,029. South Africa was the chief destination.

These are the chief features of the export and import paper trade, and we are not aware that much may be gained by tracing it into further details. The vicissitudes of the several departments may be due to local and transient influences, but the great fact stands out that Britain's position in the selling markets of the world is not improving. In fact, it is declining seriously, because the purchases of neutral markets are increasing year by year with the consumption, even as British consumption of paper is ever increasing. British paper mills have no share of this great increase. The paper industry is to a great extent typical of the mass of industries in this country. It comes wonderfully near the average.

Critics, economists, and politicians may differ about the remedy, but no one who judges figures on their merits can deny the seriousness of the situation.

All this foreign paper, which has now reached the annual value of nearly five millions of pounds sterling, enters our market free from any tax, and, bearing this fact in mind, we may look at the treatment meted to our exports when they reach various over-sea markets. The table we give below presents the average duties charged upon the total volume of British exports of British manufactures to the respective countries. Often the duties are specific, at so many dollars, francs, marks, or what not per pound weight, hundredweight, or dozen, but they have been worked out to a percentage rate:—

Average Rate of Duty on Paper.

Russia	131 per cent.
United States....	73 "
Austria-Hungary .	35 "
France	34 "
Italy	27 "
Germany	25 "
Canada	16 "
Belgium	13 "
New Zealand.....	9 "
Australia	6 "
South Africa.....	6 "

It should be noted that Canada, and South Africa charge higher duties than above on goods of non-British origin.

One would like to know for certain if the foreign paper manufacturer who sends to this market the product of his mills does so at a price lower than his home price? In other words, is foreign paper "dumped" here? It is extremely difficult to obtain precise information upon this point, and there has been, so far as we know, only one point of evidence made public. Self-interest causes both dumper and dumpee to be mute upon this question. But the United States Industrial Commission, which in the year 1901 made a fairly thorough investigation of the methods of trusts in that country, particularly in regard to the alleged policy of dumping, secured one tacit admission that the practice prevails in the paper trade. Mr. Chisholm, the

President of the International Paper Co., which produces about 70 to 75 per cent. of the paper ("news") manufactured in the United States, and which exports to Australia one-third of the paper used there, was asked: "In selling to Australia, are your profits proportionate to what they are in the home market here, or do you have to lower prices to get your market there?" He replied: "In the last year our export profits on the prices received were the highest in the business." This was a clear evasion of the point at issue. Had it been true that the company of which this gentleman is president had been selling at cost price or under it, so as to secure command of the Australian market and had just a year before he gave this testimony raised their prices a little, his answer would have fitted the circumstances. Besides, it must be remembered that could he have answered truthfully that his prices in Australia were no lower than his prices in America he would gladly have done so. It is certain, therefore, that this equivocation constituted an admission of the practice of dumping.



PAPER MACHINE WITH ROPE DRIVING GEAR.

One of the largest and most up-to-date machines ever built in Great Britain will be shortly started up in one of the principal English paper mills. It has been built by Bertrams Ltd., of Edinburgh, who have introduced many important modern improvements. The machine will have three sets of rolls, twenty-nine drying cylinders, three heavy stacks of calenders, Bertrams' patent "Simplex" strainer, and the firm's new patent system of auxiliary strainer. The machine, when at full work, will run at 400 feet per minute.

A particular feature of the machine, however, is the rope driving gear, patented by Bertrams Ltd., which appears to embody all that can be desired for driving a papermaking machine. Instead of using ropes overhead and shafts overhead, driving down to others on the

floor, there is a shaft on the floor for driving each of the parts of the machine, and on it is an expanding rope pulley which has been tested with loads far beyond anything that it will ever be called upon to drive. The rope is endless, 1½ inches diameter, preferably of cotton.

The increasing or decreasing of the diameter of the pulleys, to suit the draw of paper, is manipulated with the greatest possible ease while the machine is at work, and there is absolutely no part of the gear which runs loose in any way while the machine is in operation. It is necessary to mention this latter feature, as we understand some papermakers have been informed that loose pulleys or similar parts are employed, which is not the case. Automatic stretching arrangements for the rope are applied, and the space occupied is small; in fact, it can be got into less space than any gear in existence.

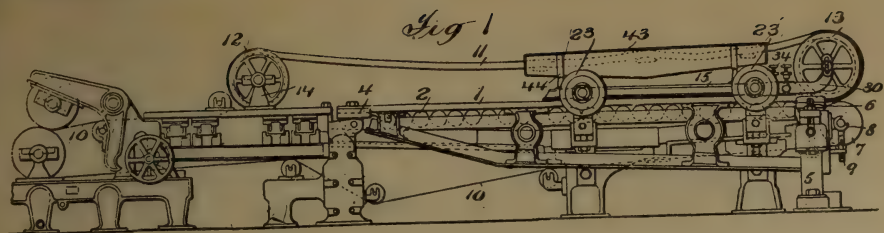
It may be mentioned that no speed wheels or other similar appliances exist on the machine, the speed of paper being varied from the slowest to the fastest through the engine alone.



NEW FOURDRINIER MACHINE.

Thomas H. Savery, of the Pusey & Jones Co., Wilmington, Del., has been granted a United States and Canadian patent on a paper making machine.

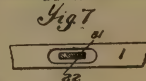
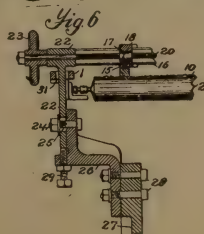
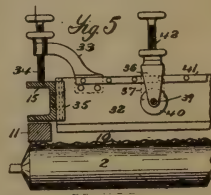
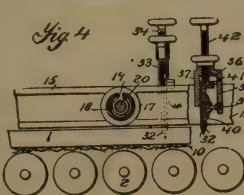
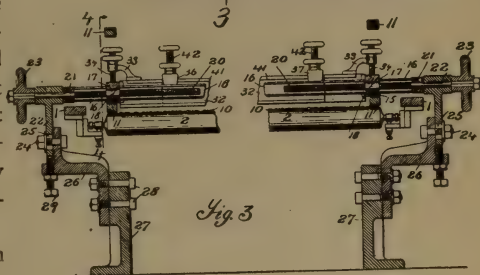
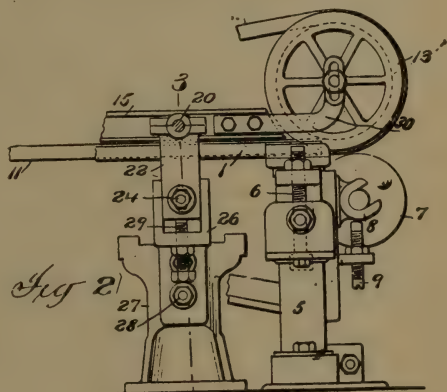
Fig. 1 is a side elevation of a paper making machine of the Fourdrinier type, embodying the invention. Fig. 2 is an enlarged detail elevation of the right hand end of the machine shown in Fig. 1. Fig. 3 is a sectional elevation on the line 3 3 of Fig. 2. Figs. 4, 5, 6 and 7 are detail views. Referring to the drawings, No. 1, in Fig. 1, indicates the shaking section, the side rails of which serve to support the usual table rolls 2. While the shaking section may be mounted and operated in any desired manner, it will preferably be supported in the manner set forth in a previous patent by the same inventor, that is to say, the ends of the side rails nearest the couch rolls are pivotally connected



to pivot blocks 4, mounted in the frame, so that the shaking section is capacitated not only for the shaking movement, but also for vertical adjustment. The opposite ends of the shaking section rails will also preferably be adjustably supported on still springs, 5, all as particularly set forth in the patent before referred to, the vertical adjustment being effected through suitable screws 6. The breast roll, which is marked 7, is suitably supported in bearings 8, connected to the shaking section, the adjustment of these bearings being determined by screws 9. The means for operating the shaking section are not shown, inasmuch as they have no bearing on the present invention; but they may be of the character described in the patent before referred to. It may be here remarked that while the construction of shaking section here illustrated and specifically described in the patent above referred to forms a convenient construction for illustrating the invention, the invention may be used with any form of Fourdrinier paper making machine employing a shaking section.

The devices for controlling the width of the stream or web of pulp on the making wire 10, which wire may be constructed, mounted and operated in the ordinary manner, consist of the usual deckle straps 11, said straps being supported on a pair of pulleys 12, at the end of the machine nearest the couch rolls and on a pair of pulleys 13, at the breast roll end of the machine. The pulleys 12 are supported by standards 14, which are mounted on a stationary part of the machine. In the construction heretofore known to the inventor, the pulleys 13, which support the deckle straps at the breast roll end of the machine, have been mounted so that they have vibrated

with the shaking section. These pulleys will be mounted so that they will not move when the shaking section is vibrated. While the construction by which the deckle strap pulleys 13 are



mounted may be varied within wide limits, in the construction shown there is provided a frame which includes a pair of side bars 15, these bars being supported and connected by pipes 16. These pipes 16 have slots in their tops, and extend through openings formed in bosses 17 in the bars 15. These bosses 17 carry nuts 18, which are connected by webs 19 to the bosses, these webs passing through and lying in the slots in the pipes. Engaging with these nuts 18 are screws, 20, passing through collars 21 at the ends of the pipes, and being then in the construction shown supported by brackets or standards 22. Outside these brackets or standards 22 the screws are provided with hand wheels 23. These standards or brackets 22 are adjustably connected by means of bolts 24, which pass through slots 25 in the standards to angle brackets 26. These brackets 26 are connected to standards 27 by means of screws 28, these standards 27 forming a part of the main frame of the machine. Set screws 29 are provided to assist in adjusting and to hold in adjustment the standards 22.

The side bars 15 carry brackets 30, in which brackets are journaled the deckle pulleys 13, before referred to. By turning the hand wheels 23 the screw 20, engaging with the nuts 18, will cause the side bars 15 to be moved toward or away from the edges of making wire 10, thus positioning the deckle straps and determining the width of the stream or web of pulp on the making wire.

The standards 22, before referred to, may in some instances be located outside the side rails of the shaking section, as illustrated in Figs 2 and 3. In some instances, however, it may be desirable to provide the side rails of the shaking section with slots 31 and allow the standards 22 to pass through said slots, as shown in Figs. 6 and 7.

In addition to mounting the deckle pulleys so that they will not receive motion from the shaking section, the slides will also be mounted so as not to receive motion from the shaking section. In the construction shown each slice is composed of two overlapping blades 32.

these overlapping blades having secured to them near their ends brackets 33, through which are tapped set screws 34, said set screws resting on the bars 15, before described. These bars 15 are provided with ways 35, in which the slices move when they are vertically adjusted, said vertical adjustment being effected by the screws 34. The blades 32 are held together by clamps, which consist of blocks 36, having downwardly projecting legs 37, 38, the legs 37 being secured to the blades 32 and the legs 38 being provided with tapped openings, through which work the screws 39, said screws serving to force and hold clamping pads 40 against the blades 32, which are not connected with the legs 37. One of the blades 32 is provided with a rib or side extension 41, against which bears a screw 42, which is tapped through an opening in the block 36. It will be seen that when the side bars 15 are adjusted in or out by turning the hand wheels 23 the overlapping blades which form the slices will be caused to move in or out.

The machine shown is provided with cleaning troughs 43 for the deckle straps, which may be of any usual construction, and these troughs are also mounted, so as not to be affected by the movement of the shaking section. While the troughs may be mounted in any desired manner, in the preferred construction they will also be carried by the bars 15 before referred to, and to this end the bars are provided with upwardly extending forked extensions or yokes 44, in which the troughs are located.



CROWN SALES OF ONTARIO TIMBER LIMITS.

Never before in the history of Canada was there such a large assemblage of lumbermen gathered together at one time as that which attended the fifteenth Government sale of timber limits, held in the Legislative Assembly Chamber of the Parliament Buildings, Toronto, on December 9th, when Peter Ryan knocked down 826 square miles of timber lands

w Ontario. Representative men from parts of the Dominion were present in addition to contingents from the United States, including Michigan, Minnesota, New York State, Ohio, Wisconsin and the far West. The sale was the most successful ever held, the prices received far exceeding the expectations of the Crown Lands Department. The average price paid per mile was \$4,450, and in view of the fact that the dues have been increased from \$1.25 to \$2 per thousand feet and the ground rent from \$1 to \$5 per mile, these figures are most remarkable.

The sale emphasizes particularly the fact that timber is becoming scarcer, and it will have the effect of materially strengthening the market. The Temiskaming Railway was another factor that caused the increased prices. Milton Carr, M.P., of Parry Sound, stated that the fact that the line would soon be in operation resulted in at least \$1,000,000 more being received than would have otherwise been the case. The great success of the sale was to some extent due to the fact that this year the limits were put up in small blocks, as, in addition to the big operators, a large number of comparatively small traders were present, attracted by the opportunity of purchasing limits within their means, and the good prices obtained was largely due to their spirited bidding.

The largest buyer was C. Beck, of Penetanguishene; next to him came Thomas Mackie, M.P., of Pembroke, who also paid the highest figure per square mile, namely, \$31,500 for a limit three and a-quarter miles in extent, situated in the Township of Hammell. His total purchases amounted to over \$400,000. The purchases, mostly in Nipissing, of the Ottawa Valley men, totalled \$900,000. The biggest American buyer was J. H. Shevlin, of Minneapolis, whose purchases in Rainy River totalled \$315,000. Brooks, of Minneapolis, also paid \$14,000 for limits in the same district, and Hill, of Saginaw, \$30,000.

The following are the locations of the limits offered for sale: Nipissing district, pine limits only, 445 square miles;

Algoma, pine limits only, 194 square miles; Rainy River, pine limits only, 43 square miles; pine, spruce, cedar, tamarac and poplar, 123½ square miles; Lake of the Woods, pine, spruce, cedar, tamarac and poplar, 41¾ square miles.

The purchases in the aggregate were as follows:—

C. Beck, Penetang, 69¼ miles...	\$545,925
Thomas Mackie, M.P., Renfrew, 39½ miles	436,475
Wm. Power, Quebec, 27½ miles.	337,650
F. H. Shevlin, Minneapolis, 129 miles	337,350
Georgian Bay Lumber Co., 45 miles	316,300
W. A. Tilley, Toronto, 16¼ miles.	166,563
L. E. Dancy, Goderich, 14½ miles	166,250
D. Graham, Renfrew, 51 miles...	163,147
Ferguson & McFadden, Sault Ste. Marie, 26½ miles.....	132,650
W. P. Bull, Toronto, 72 miles...	115,200
A. S. McPherson, Longford, 9½ miles	81,375
I. Grant, Orillia, 29½ miles.....	80,313
W. F. Munro, Pembroke, 5¼ miles	65,625
J. D. Fraser, Ottawa, 12½ miles..	60,000
J. D. Ransom, Sault Ste. Marie, 8½ miles	45,900
J. M. Savage, Rat Portage, 38½ miles	42,450
Echo Lumber Co., 3½ miles.....	36,750
Dr. Spohn, Orillia, 26 miles.....	35,575
G. D. McArthur, Winnipeg, 24 miles	33,600
H. S. Brennan, Hamilton, 19¼ miles	31,725
Arthur Hill, Saginaw, Mich., 4¼ miles	30,813
D. C. Cameron, Rat Portage, 16¼ miles	27,425
P. McDermott, South River, 12½ miles	25,425
Mason & Gordon, Montreal, 3¾ miles	24,375
J. C. Brown, Ottawa, 3¼ miles..	23,562
Burton Bros., 4 miles.....	22,400
James Playfair, Midland, 4 miles.	21,000
D. E. Sprague, Winnipeg, 8 miles	19,200
James McCreary, Arnprior, 5½ miles	16,500
R. Bunyan, North Bay, 11½	

miles	14,375
F. Brooks, Minneapolis, 2 miles.	14,000
John Nunn, Pembroke, 6¼ miles.	11,250
H. Burritt, Pembroke, 3½ miles.	3,500
G. McKeown, Hensall, 2¼ miles	1,800

The total amount of the sale was \$3,677,357.50, being \$1,362,357.50 in excess of all previous records. For the purpose of comparison the following table of previous sales is interesting:

Date.	Square miles.	Highest. price per mile.	Average price per mile.
1868	38	\$ 519	\$ 380 17
1869	98	418	260 86
1870	12	640	640 00
1871	487	500	241 62
1872	5,031	1,000	117 79
1877	375	500	201 97
1881	1,379	2,300	532 00
1885	1,012	1,250	314 87
1887	459	6,300	2,859 00
1890	376	2,625	919 06
1892	633	17,500	3,657 18
1897	159	6,600	1,665 07
1899	360	8,500	2,010 00
1901	399	4,700	1,835 41
1903	826½	31,500	4,449 25

It is gratifying to note that nearly all the buyers are Canadians. The largest American buyer was F. H. Shevlin, of Minneapolis, one of the Backus-Shevlin syndicate, who secured 129 square miles of pine, spruce, cedar, tamarac and poplar limits in the Rainy River district. This company have secured a water power at Fort Francis, and are erecting large mills there.

That the proceedings were not lacking in dramatic and oratorical effect will be seen from the following extract of a report of the sale published in the Toronto Telegram:

"There are auction sales and auction sales, but when it comes to selling 'goods' to the value of millions and having your auctioneer's stand on the floor of your legislative hall it is an event to be chronicled in press and library. Aubrey White, with his staff of eight clerks and officials under Major Crozier, will attend to the history in book form. They occupied a table directly below the

auctioneer's stand, placed on the Speaker's dais. When Peter Ryan arose in the blue-green painted stand at 1.30 the great hall was filled with lumbermen from everywhere. Many members of the Government and the House were there. Speaker Charlton and Hon. Mr. Latchford sat near the dais. Timber Inspector J. B. McWilliams, of Peterboro', with his flowing beard, sat next to an officer encircled with maps. There on the dais to the right of the auctioneer sat Hon. Mr. Davis and Aubrey White to give directions. There was nothing particularly noticeable in the appearance of either.

Not so with the auctioneer. From Mr. Ryan's expansive shirt front a great diamond dazzled the eyes of all under the brilliant incandescents. But more dazzling than either was his glittering and audacious phrase.

The pursuant to Order-in-Council, etc., had to be read, and he had to read it. But it seemed to grate upon him. It was so far from fitting so great an occasion. Here he was upon a throne, and so he instantly recalled King John—Shakespeare's version, in that fourth act where Pembroke and Salisbury and other lords accompany him to the throne. Down there were Pembroke Davis and Salisbury White. But they only had thinking parts, and King John (Peter Ryan) the centre of the stage.

"Now," he intoned with dramatic gesture as he got through the pursuant-to-Order-in-Council-Commission, "you all know the value and importance of these great timber berths, and how necessary it is that you should keep pace with your business as lumbermen. There is no business in which there are so few failures. But why should I seek to gild refined gold or paint the lily?"

Salisbury White smiled as if he recalled those famous words of Lord Salisbury to King John. Then from a lumber witness near the press table came this fitting paraphrase, "To get our pile of gold you need not paint the timber."

But Peter Ryan had covered miles "on the square" in his oratorical steeplechase. Here are a few of his mirthful and eloquent asides:—

The Lord loveth a cheerful bidder.
 This silence will break my heart. Why
 n't you bid?
 Now, I will show my humiliation by
 cepting that small offer.
 Why stand ye idle all the day?
 The timber is as thick in this town-
 ip as hair on a dog.
 No, no, Horatio; this will not do.
 Cassius, I love thee well, but I cannot
 cept that bid.
 Now, another hundred, just to please
 e child.
 You won't be happy till you get it.
 I'll just take that \$300. The Govern-
 ent needs it.
 I would like to oblige the owner of
 at stentorian voice, but I cannot.
 We take no \$50 advance from a man
 your rank and station.
 Now, don't make any mistake with
 our hymn books.
 Here's a new township. We'll sing a
 ew song.
 Now, don't leave me in distress with
 his on my hands.
 We are making you rich in spite of
 ourself.
 Notwithstanding the Alaskan boundary
 ward, it will do you no harm to become
 ossessed of this valuable tract of forest.
 Ye men of the northern zone, why
 on't you bid?
 Just as the night cometh when no man
 an work, just so the hour will soon
 ome when there will be no more timber
 mits to buy."



FORESTRY AT THE ST. LOUIS FAIR.

The Exhibits of Forestry and Fish and Game at the St. Louis Exposition of 1904, will be united in a building 300 feet wide and 600 feet long. In addition to the inside exhibits of the Forestry Department, space is being set apart for displays of the Government methods of tree planting and forest management. These exhibits, which are not confined to the United States, must prove instructive to all interested in the future of the forests. The exhibits from foreign countries will include forestry policy, as well

as the forest industries. One of the popular elements of the display of the United States Forestry Bureau will consist of immense color transparencies illustrating particular phases of forest life and conditions; for instance, the big tree and the sugar pines of California, choice bits of Appalachian farm land and forests, results of tree planting, and other instructive forest subjects. Other features of the scientific forestry display will consist of photographs of trees and flowers, botanical literature, sections and other specimens of trees and plants. The tools of the lumberman and saw-mill worker will be fully displayed.

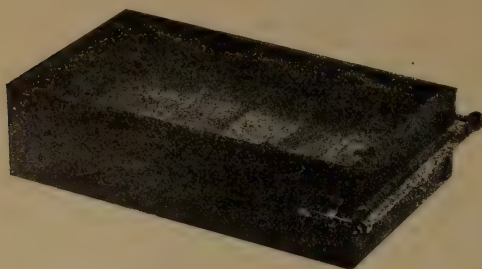
A special object of the display will be the complete illustration of the economic uses of valuable trees, such as yellow pine, white pine, loblolly pine, cedar, cypress, redwood, spruce, fir, hemlock, and other coniferous trees, as well as the hard woods. While the scientific illustration of these species will be very complete, the economic history and utilization will be shown with equal thoroughness.



PLATE HOLDER WITHOUT SCREWS.

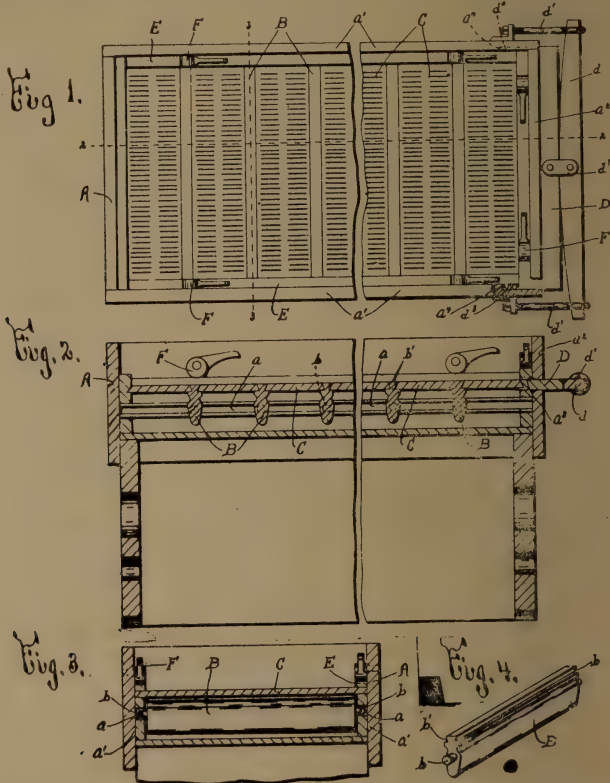
The Blaisdell Screen Plate Company is the name of a new concern, located at Oakland, Me., for the manufacture of the Screwless Screen Plates and Holders, also cypress and hard pine vats and other paper machinery. J. H. Blaisdell, now of Oakland, Me., formerly of Worcester, Mass., with stores at Boston, New York City, and Philadelphia, a man well known in trade and machinery circles, is the inventor of this screen, and the organizer of the company, which is capitalized at \$100,000 under the laws of Maine. The principal specialty of this company is the Patent Screwless Screen Plate Holder referred to, for use in both paper and pulp mills. It is heralded as the only practical device in use, and its principal points of superiority include absence of all iron inside the vat, bronze cradles, and the important fact that it will fit any diaphragm

screen. The plates are made for all kinds of paper, running from tissue to cardboard. In taking out plates affixed in the present method in general use,



it is necessary to remove some 400 screws for each screen. Mr. Blaisdell's plates can be removed in a couple of seconds by simply slacking two bolts or

The bronze cradles are hung on trunnions in grooved boxes the entire length of the vat, which produces an automatic adjustment, and when it becomes necessary to unlock the plates it is done by the slacking of two bolts. The plates then rock back in the grooves, allowing the plates to be removed easily. Three minutes only are required to change a set of plates, and when locked the plates are as rigid as a piece of iron in a blacksmith's vice, and are warranted never to get loose or leak. W. Thompson, superintendent of the Knott Brothers paper mills, at Watertown, N.Y., was one of those who tested the invention, and in a letter to Mr. Blaisdell, says: "The plates seem to be perfectly



nuts. The operation that now requires hours can be done with this device in a few seconds. The invention has been fully tested for the past year in four of the largest paper mills in the United States, to their entire satisfaction; and they are now duplicating their orders.

fectly rigid, and I think it will do at 15 per cent. more work than the fashioned screw plates, as there is no wood under the plates, there is nothing for the pulp to collect on, causing buildup in the stock. The plates can be changed by simply slacking one screw, which

a great saving of time over the old tops. It is easily washed out, and the seal is never broken." The company propose to place this screen on the Canadian market, and are open to negotiate with manufacturers of pulp and paper machinery for rights for the Dominion.



PAPER FROM CANADIAN PEAT.

Major C. A. Paterson, of Beaverton, has given the Orillia Packet some information regarding a new industry in process of development near that place. It is nothing less than the manufacture from peat of pulp for cardboard and wrapping paper. The process is an Austrian invention, and a machine has been procured from that country to test the possibilities of putting the peat beds to similar use. Toronto and Hamilton capitalists are interested in the experiments, which so far give promise of entire success. They have secured options on a fine bed of peat a few miles south of Beaverton, which is said to be twenty feet deep. All peat is not suited for manufacture into pulp, but this bed is believed to be particularly well adapted to it. The Austrian inventor of the machine, who came out to set it up, says the peat is much better than that found in his own country. Some pulp sent to the Cornwall paper mills for finishing, turned out cardboard of a particularly strong fibre, and is as tough and pliable as leather. It has the peculiar advantage that it will fold without breaking, and it is well adapted for such purposes as boxes, egg crates, etc. Peat has been sent from all parts of Ontario, and even from Michigan, to test its suitability for the purpose. The Beaverton Company has control of the patent rights for the machine for this country. The one they have at present is small, and they purpose setting about the manufacture of a larger.



FORESTRY IN THE UNIVERSITIES

A student of the School of Practical Science writes to the Toronto News: "Apropos of the introduction of a

course in forestry, it should be remembered that the prospective graduate will be under the somewhat inconvenient necessity of creating a demand for his own services. Forestry as yet is not a profession in Canada and certainly will not be for some years to come. It is, however, closely allied to engineering practice and for the present and near future will have to be a sideline with the professional engineer. The School of Science has, since its inauguration, endeavored to give a general rather than a special training in the theory of engineering in all of its regular three years' course, the fourth, a post-graduate year, being devoted to specializing in selected subjects. A gentleman prominent in engineering journalism in Toronto recently gave it as his opinion that the new course in forestry should be established as one of the regular three year courses at S.P.S. instead of creating a new department in the university especially therefor. And it is right that it should be so. It could be done by an outlay of \$1,000 per year on the part of the Government, against perhaps \$5,000 per annum if the alternative method were adopted. Let a course in engineering and forestry be instituted at S.P.S. with an option of forestry for the degree of B.A.Sc., and this will amply provide for the necessities of the work in Canada, and in addition will be properly in accord with the traditional policy of S.P.S. as outlined in its curricula during the past twenty-three years."



THE MAKING OF BOOKS AND PAPERS.

When figures get beyond a certain point they lose their concrete value, and it is necessary to resort to some other means if we wish to make comparisons involving figures that run up into millions and billions. Therefore we adopt the method of representing these figures by comparison of bulk and form. The basis for the comparison which we have worked out, says the Scientific American,

is the twelfth census of the United States, taken in 1900.

The manufactures of paper and wood pulp have become so closely related that they are now usually treated as a single industry. Over 1,986,000 cords of wood were used in 1900 in the production of paper pulp. This would make a cube 634 feet high, and is a pretty large wood pile when compared with Trinity Church, New York. Straw comes next, 367,305 tons being consumed annually, and making a pile of bales 607 by 405 by 270 feet. We have not considered the subject of chemical fibre, owing to the diverse forms in which it is consumed, although the bulk is very great, amounting to 644,000 tons. The old as waste paper consumed amounted to 356,193 tons. This would make a solid 499x348x254 feet. Two hundred and thirty-four thousand five hundred and fourteen tons of rags were consumed; this would make a pile of bales 436x284x207 feet high. Ninety-nine thousand three hundred and one tons of Manilla stock, including jute bagging, was also used.

Now, having dealt with the vast proportions of the raw materials, we come to the finished products. Our comparisons show "news" paper in two forms: First, in the roll, 454,572 tons making a roll 450 feet long and 225 feet in diameter. News papers in sheets amounted to 114,640 tons. Five hundred and thirty-five thousand two hundred and fifty-two tons of wrapping paper would make a roll 450 feet long and 225 feet in diameter. Book paper follows, the product being 351,702 tons. This would make a pile of crate 563 feet long by 371 by 44½ feet. Stationery is another considerable item. One hundred and twelve thousand seven hundred and seven tons would make a box of stationery 427 feet long by 267 feet wide by 56 feet thick. Squares filled with printing presses denote the relative number of periodicals of various kinds. Thus the square marked "Monthly" stands for 1,817 periodicals; the "Daily" stands for 2,226 periodicals, and the "Weekly," 12,979 publications. To print the finished product requires the services of 204,791 printers. The value

of printing products, excluding the value of the paper and pulp product, which amounts to \$127,326,162, is \$347,055,050, would make a solid silver column 100 feet high and 27 feet in diameter.



REASONS FOR THE U.S. SHUT-DOWN.

Thanksgiving Day, the 26th of November, marked an unusual event, the shutting down in the East for five days, and in Wisconsin for three days, of the principal print paper mills. The International Paper Company, with twenty-eight mills and about 10,000 employees, claims the cause to be "low water, shortage of wood pulp," etc. The Great Northern Mills at Millinocket, Maine, also shut down, they say, on account of "low water." Employees all idle, of course. Others among Eastern mills that followed suit are the Bowdoin mills, Topshan, Me.; the Pejepscot mill at the same place and the Lisbon Falls mills. "Low water, shortage of pulp," etc., are also given as the cause of these shut-downs, but the general opinion of the consuming trade is that the main object of this temporary stoppage of the mills has been to prevent accumulation of paper, protect prices and forestall a possible slump in the market. In the case of the Wisconsin mills, they do not hesitate to come out fair and square and say the reason was to protect and maintain prices. As these mills have all resumed, it may be said truly that the stock of paper is short many thousands of tons, and prices may be expected naturally to continue firm, but an advance will surprise no one.—The Paper Trade.

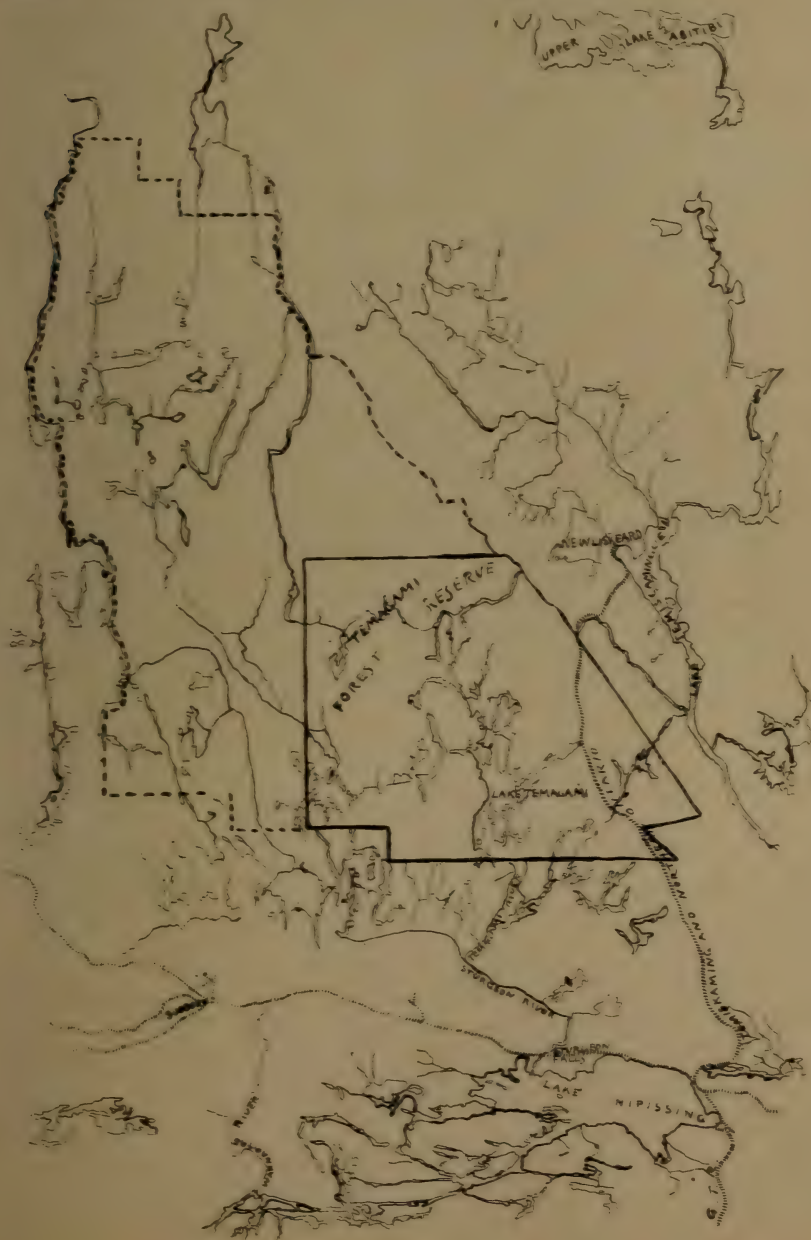


—The Journal publishes a special Quebec despatch stating that, previous to his departure for Europe, Mr. Ernest Pacaud sold the *Soleil* for a sum of \$112,500. The purchaser is said to be Sir C. A. P. Pelletier, acting for a syndicate composed of himself, the Hon. Charles Fitzpatrick, the Hon. S. N. Parent and Mr. Lucien Pacaud.

NEW ONTARIO FOREST RESERVE.

Hon. E. J. Davis, Commissioner of Crown Lands of Ontario, has made an important addition to the Crown forest reservations of the Province, forecasting a policy of forest preservation in northern Ontario. Three years ago a forest

reservation of 2,200 square miles in the Temagami district, and now this reserve will be increased by another 3,700 square miles, making a block of 5,900 square miles. As the sale of less than 900 square miles the other day realized \$3,677,000, it will be seen that such reserves will be of immense value as a public asset, apart from the influence of such reserves on



the climate and rainfall of the Province affected. This vast forest preserve is bounded, roughly speaking, as follows: On the north by the Height of Land, on the east by the Montreal river, on the south-east and south by the old Temagami forest reserve and the surveyed townships, and on the west by the west branch of the Wahnapiatae river and the Metagami river. Much of this land is not adapted for farming, and none of it has been opened for farm settlement, so that no existing interests will be injured by reserving it. As will be seen by the accompanying sketch map, the Temiskaming and Northern Ontario Railway runs through the eastern corner of the reserve. The black line shows the boundary of the present reserve, and the dotted line the boundary of the new reserve.



ESTIMATING MOISTURE IN PULP.

There are already so many accurate methods and apparatus described in technical periodicals and text-books for the best possible estimation of moisture that it would seem almost next door to incredible that differences should ever arise on this score between buyer and seller. Such differences do, however, frequently occur in the case of air-dry cellulose or wood pulp, and the cause is chiefly due, not to the inaccurate carrying out of the tests or to the use of faulty apparatus on either side, but to atmospheric influences, or the way in which the stuff is kept till delivered.

The vendor or manufacturer tests the stuff before it is packed, i.e., as it comes completely dry from the machine or drying room—and the consignment is made on the weight of the perfectly dry stuff. If good dry cellulose or wood pulp is carried by rail in continuous damp weather, or stored for weeks and months in a damp place, it greedily absorbs the largest amount of moisture it possibly can, owing to the hygroscopic nature of the fibres, and does not give up such moisture at all readily when stored in

other places. If such stuff be tested after some time by the consumer, there is naturally a difference in the weight of the dry contents to the disadvantage of the purchaser, and the result is trouble on both sides.

A writer in *Wochenblatt für Papierfabrikation* points out that in a particular mill there was often a difference of 2 per cent. to 5½ per cent. on consignments between the tests made by both sides, always to the disadvantage of the purchaser. It is noteworthy that this occurred regularly on consignments from stock. A whole consignment was accordingly reweighed accurately, and was found to have gained in weight equal to the difference of the dry contents, thus settling the question to the satisfaction of both parties. To avoid such differences, the determination of the dry contents should either be made immediately before delivery, or, if this is not possible, the separate roll or bales should be marked with the weight which they had when packed—i.e., when tested for their dry contents—so that the consumer, in case of any difference, can quickly detect any increase in the weight of each bale, and so avoid having to reweigh the whole consignment.



THE THIRTY-THREE ARTICLES OF QUEBEC FORESTRY.

The following are the thirty-three conclusions arrived at by the Hon. Geo. W. Stephens in his report as Commissioner on Colonization and Forestry in the Province of Quebec, referred to in last issue.

1. A forest reserve to consist of the lands proper only for forest culture.
2. A system of scientific forestry and systematic reafforesting of the burnt districts, vacant lands and waste places.
3. The establishment of a Forestry Professorship and the establishment of a system for the preservation and perpetuation of the forest supply and a trained staff of foresters.
4. The perfection of our system of fire

rangers and its application to the whole Province.

5. A penalty on lumbermen keeping large districts flooded by the back water of closed dams, which should be opened after the drive has gone out.

6. Efficient fire protection.

7. The prevention of complete denudation of hills and protection of the water supply.

8. A close season for setting fires near the forests from the 1st May to the 1st October in each year. When a dry spring occurs, accompanied by a dry April, the close season should commence on the 1st day of April. A dry April is sure to bring a crop of bush fires.

9. A fire strip of fifty feet between the abbas and the forest.

10. The withdrawal from settlement of lands not fit for farming purposes.

11. The abolition of the practice of selling isolated lots in the midst of timber limits.

12. The abolition of the practice of selling lots to speculative jobbers who take up land simply to defraud the Government of its just dues, and who never intend to cultivate the land so taken up.

13. Adopt a system by which the districts which are suitable only for forestry shall not be settled upon by squatters.

14. The license holder should have one year clear from date of notice to remove merchantable timber from lots which are withdrawn from license.

15. Separate the lumbering from the agricultural interests as far as possible.

16. The dismissal of incapable Crown Lands agents, and a rigid enforcement of the regulations in regard to shanty books and the periodical examination of the lumbermen's books.

17. Capable, educated woodsmen, Government employees to inspect the lumber camps to see that the Government regulations are being carried out, and that a faithful account is being rendered of timber cut and the diameter cut regulations enforced.

18. Summary process of lot cancellation.

19. Every encouragement and facility to bona fide settlers.

20. Concentration of settlers on good lands.

21. Compact contiguous groups so that each settler will be near a neighbor. This can be accomplished by continuous settlement.

22. Selection of proper land for settlement purposes, and intelligent and active Crown Lands agents, having a knowledge of the quality of the lots in their districts, capable of directing intending settlers to suitable lots.

23. Colonization roads of the best kind.

24. A substantial bonus to counties where no forest fire has occurred within the year, such bonus to be devoted to the construction of macadamized roads.

25. The expenditure of the funds for colonization roads to be made, upon regularly surveyed routes laid out by a competent engineer or surveyor, on routes advantageously laid out for continuous settlement.

26. The expenditure of colonization money to be strictly confined to colonization districts. Old settled districts should raise money by local taxation for roads and bridges within their limits.

27. Location of routes should be approved of by the Colonization Department only.

28. Holders and occupants of Crown lands should be liable for municipal taxes for roads.

29. Grants to Colonization Societies should cease.

30. The Province should share equally in the net profit on transfers of licenses.

31. Double the Crown charges for timber dues. The effect would be to give a handsome surplus to the Province, and relieve us from the necessity of disposing of our remaining limits below their value.

32. Sales of limits should be made in the fall with full information of the contents of limits approximately on the report of skilled woodsmen explorers. Not less than one year's notice of such sales should be given so that intending purchasers can have time to explore the limits offered for sale.

33. Water powers should be sold on ninety-nine years' lease at so much per

horse power developed. A time limit of number of horse power developed to be an absolute condition under penalty of nullity.

Mill Matters.

Contracts to deliver Quebec pulp wood to New England mills are not likely to be fulfilled because of low water in the rivers.

The paper mill companies in and about Watertown, N.Y., have purchased from Canadian parties 100,000 cords of pulp wood to be delivered next year at Cape Vincent docks.

It is now reported that W. J. Finlay has decided to rebuild the paper mill at Strathcona, which was destroyed by fire. He expects to have it in operation by the first of February.

It is reported at Three Rivers that a French and Belgian syndicate is buying the valuable timber limits owned by Mr. Alexander Baptist, as well as 150,000 logs already cut. The limits cover 150 square miles.

Last month three townships, numbered 124, 125 and 132, in north Ontario, constituting a block of 108 square miles, were sold by Ferguson & McFadden, of Renfrew, to Carney Bros., of Marinette, Wisconsin. The limits were formerly owned by Gen. Alger. The price is not disclosed, but is said to be a high one.

The Sturgeon Falls Advertiser says: "Night and day, stopping only for Sunday, the machinery of the Imperial Paper Mills is turning out many miles of paper to help appease the voracious appetites of the newspaper presses in many climes. Everything is running smoothly, and the production in quality and quantity exceeds expectation at this stage of development. It is interesting to note that upwards of 250 men are employed in and about the mills, while the pulpwood camps are manned by a force of nearly 300, which will be increased to 400."

The Maritime Sulphite Fibre Co., of Chatham, N.B., whose mill has been closed for a long time, is being wound up, and claims are to be filed by December 28th at the office of Hon. L. J. Tweedie at Chatham, or at the office of A. H. Hannington, St. John, N.B.

A new mill has been built at Missisquoi Point, N.S., by the Baie Chaleur Lumber Company, a French-American company, which has timber limits in Quebec. It will be in operation next spring, and will manufacture all kinds of lumber, including pulp wood for export to Europe.

It is expected that there will be a large cut of timber the coming season on the St. Croix waters, N.B. The cut will probably reach 50,000,000 feet, of which H. F. Eaton's Sons will cut 10,000,000 feet, and James Murchie's Sons about 8,000,000. About one-quarter will be used for pulp.

There has been a change in the personnel of the Ste. Anne Water Power Company, which has been producing a large quantity of pulpwood at Beupre, Que., during the past two years. R. Loomis, Jr., president, and R. M. Loomis, secretary and treasurer, have sold out their interests to Oscar W. Ordway. Oscar W. Ordway has been elected president, and H. P. Ordway, secretary and treasurer. The remaining directors are C. E. Taschereau and L. A. Cannon.

The Paper Trade Journal reports that representatives of the Self-closing Bag and Paper Company, of Nashua, N.H., have been looking over Shawinigan Falls, Que., in order to decide whether or not to establish pulp paper mills there. This New Hampshire company is composed entirely of French-Canadians domiciled in the New England States. Its capital is \$500,000. The members of it who formed the party to examine conditions at Shawinigan Falls were J. T. Lord, of Nashua, N.H.; W. E. Cloutier and Elie Rop, of Lewiston, Me. With them on the inspection was L. A. Lord, representing the Crown Lands Department of Quebec, and Dr. A. Jutras, of Three Rivers. J. T. Lord is a son of L. A. Lord. A report favorable to the project is likely to be made to the directors.

Little & Walker, paper and pulp mill experts and engineers, announce that they have removed to 93 Broad Street, corner of Franklin Street, Boston, where they have greatly extended their facilities for handling all matters relating to technical chemistry.

The Mill Stream Lumber Co. has been incorporated to operate pulp and paper mills on the Metapedia river, Rimouski, Que. The company, which has a capital of \$20,000, and includes F. D. Wilsey, New York; C. E. Taschereau, L. A. Taschereau, F. Roy and L. A. Cannon, of Quebec, have purchased part of the extensive Ordway limits, and will commence the construction of their plant in the spring. The headquarters will be in Quebec city.

At the last annual meeting of the St. John Sulphite Co. a committee consisting of R. H. Hay and J. S. Tait, C.A., were appointed to advise the directors as to the company's affairs. The directors, after conferring with these gentlemen and obtaining information from St. John, instructed their auditors, Messrs. Chiene and Tait, to investigate the company's affairs, and A. R. Yule, of that firm, will proceed to St. John with authority to obtain cash advances, with the view of working up stock on hand and closing the mill. Should pulp advance, the mill will resume work.

The Western Pulp and Lumber Mills Co., composed largely of Vancouver (B.C.) citizens, will erect a pulp mill at an early date. The local concern, which leased limits from the Government some time ago under the special Act passed to promote the pulp industry, has also secured sufficient capital to establish the pulp industry. Thus there will soon be two mills running in the Province. The manufactured article will be shipped principally to the Orient, and the mills, the site of which has not yet been made public, will be tributary to Vancouver.

Both United States expeditions to Labrador the past summer have met with misfortune, and it is feared that the last one sent out by the publishers of Outing has had a fatal termination. Leonidas

Hubbard, Jr., the leader of the Outing party, left Rigolet, Labrador, August 1st, and neither he nor any member of his expedition has been heard of since, though a band of Montagnais Indians went 150 miles inland in search. Failure to take sufficient provisions accounts chiefly for these disasters.

A bill amending the Land Act of British Columbia, and dealing especially with timber lands, is before the Provincial Legislature. The bill provides for twenty-one year leases of unpreempted Crown lands for the purpose of cutting timber, spars and lumber on payment of a royalty of fifty cents per thousand feet, scale measurement, in addition to the annual rental of twenty-five cents per acre, except where the lessee operates a sawmill of a capacity of over 1,000 feet per day for at least six months in the year, when the rental will be fifteen cents per acre. This is to remedy the abuses by foreign owners, who tow the logs out of the Province for cutting. Special licenses for logging purposes will not be granted for more than 640 acres, or for a greater period than five years. Other clauses regulate by taxation or otherwise the cutting of certain classes of timber and lumber.

The Vancouver News-Advertiser gives further particulars of the new pulp mill which is to be erected on Swanson Bay, Northern British Columbia, for operation in the spring. The Oriental Power and Pulp Company has commenced work, and is clearing a site. The mill will have a capacity of fifty tons a day. The News-Advertiser adds: "The timber limits possessed by the company amount altogether to the huge total of 83,200 acres. These limits are located in the district around the mill site, on Gardner's canal, the south end of Princess Royal Island, Green Island, Klekane, Altanhash, Khutze and other places. Of this huge total 62,000 acres have already been selected and surveyed. The balance has been cruised, and is all ready for survey. The necessary capital for this important enterprise is nearly all being supplied in England and Scotland, J. J. Palmer, of

Toronto, the former president, being the only Canadian shareholder. The board of directors consists of Col. W. A. Mellis, William Walker, J.P., John Yule and E. B. Wyman."

Wm. Bangs, of New Haven, Conn., imported a quantity of pulp from Nova Scotia, and the collector of customs assessed a duty at the rate of 25 cents per cord, the same as in the case of such imports from Quebec. Bangs paid it under protest, and the Board of Appraisers at New York has sustained the protest on the ground that the wood was taken from private lands and not Crown lands, and that Nova Scotia did not levy any tax or assessment on pulp or pulp wood exported as in the case of Quebec.

The New Brunswick Government appears to have made a compromise with the lumber interests in the matter of stumpage which has now been made \$1.25 instead of \$1.50 per 1,000 as contemplated a month or two ago. The rate ruling till now was \$1 a thousand, and the new \$1.25 scale will apply to this winter's cut. There will also be a charge of \$8 per square mile for renewals of leases, instead of \$4 as heretofore. Under the new regulation, stumpage must now be paid on tops. New regulations are to be made for the better protection of the forests from fire.

The Backus-Shevlin syndicate have arrived at an understanding with the Ontario Government for the development of water power at Fort Francis. The company will spend \$480,000 in erecting a reservoir and dam to supply water all the year and power house to develop 10,000 horse power, of which 5,000 will be for use on the Canadian side. A thirty-ton pulp mill is also to be erected on the Canadian side. It is also agreed that half the horse power reserved for Canadian use shall not be exported to the American side if at any time it should become idle. This stipulation was the main thing standing in the way of an agreement, but the Government was firm on this point. The Government also reserves the right of forfeiture in case the syndicate fails to carry out its agreement.

To make this effective the power house will be situated on the Canadian side of the international boundary. The maximum price of power supplied to the town will be \$12 per horse power off the wheel, or \$14 per electric horse power. The syndicate is required to pay \$5,000 to the Government for the concession. The syndicate includes D. W. Backus, W. F. Brooks, and T. H. Shevlin, of Minneapolis. The last named purchased 129 square miles of timber limits in the Rainy River district at the recent Government sale, reported on another page of this issue.

S. Wertheim, of the large German pulp firm of Wertheim & Co., recently gave an interesting interview to a representative of the World's Paper Trade Review in London. After expressing the opinion that a free trade policy would best suit the paper mills of Great Britain, Mr. Wertheim made the following comments on the pulp situation in Canada: "As far as the Sault Ste. Marie Company is concerned, this mill, except during the boom, has never exported any quantities to speak of to Europe, and can consequently not affect the European market. The collapse has not come as a surprise to me. I do not wish to say any more on this subject. As to the Belgo-Canadian Company, their great loss in the beginning was to be foreseen, and must have been expected also by the company itself, as they experienced great mishaps in the beginning, and lost their manager in the midst of construction. From what I know of the mill, however, I should think that with good management pulp could be made there at a profit. I have never believed in the exaggerated cheap calculations of Canadian pulp mill promoters, and have, therefore, refrained from investing capital in the many schemes that have been submitted to me. On the other hand, however, I cannot endorse the pessimistic views expressed in some trade journal on the Canadian pulp industry. On the contrary, I consider well situated and well managed Canadian pulp mills can produce pulp at a lower price than Norwegian, and at a somewhat lower price than Swedish ones, and

the results of existing well managed and well situated Canadian mills confirm this."

The Nova Scotia Pulp mills, at Mill Village, N.S., are again running.

The MacLaren Co., of Buckingham, has sold its entire output of pulp in the British market.

It is reported that the Sissiboo Mills will be restarted soon, but for the manufacture of lumber and not pulp.

Peter Lyall, of Montreal, has purchased the Scotstown property in Compton County, Quebec. There are eighty-seven square miles of timber in the limits.

The Royal Pulp and Paper Mills, of East Angus, the Brompton Falls pulp mills, and other industries on the St. Francis and Magog rivers are still idle through the unprecedentedly low water.

Alfred Dickie, the lumber merchant, of Nova Scotia, has bought 80,000 acres of timber lands from the United Lumber Co., with which H. M. Whitney, of Boston, was connected. The property is along the St. Mary's river. The United Lumber Co. still holds 150,000 acres in Nova Scotia.

The Imperial Paper Mills at Sturgeon Falls has adopted the plan of shutting down at 6 on Saturday night and re-opening at 7 Monday morning. This makes the Sunday closing of paper and pulp mills a general practice throughout Canada, as we understand it now is in the United States.

The By-Products Paper Co., successors to the French-Hickman Flax Fibre Co., have after many delays started up their plant at Niagara Falls, N.Y. The original company and their successors have experimented on flax and other waste vegetable fibres for paper, and state that their efforts have succeeded. Fifty hands are employed at the start.

W. A. Preston, of the Rainy River Pulp and Paper Co., has been visiting Toronto, in the interests of the projected mill, which will be located on the Sand Hill river. At an estimated cost of \$12,000 on dam construction, a head of 40

feet can be secured yielding about 8,000-h.p. The present plans contemplate a mechanical pulp mill of 30 tons, and a chemical mill of 20 tons' capacity, and later on a paper mill. A spur line of railway will be built to the Canadian Northern, five miles distant.

Another phase of the controversy over the countervailing duty on Canadian pulp has come before the Board of Classification of General Appraisers. It was based on protests made by manufacturers of sulphite pulp in New Brunswick against the levying of the duty on their shipments to this country. It was shown that New Brunswick does not levy an export duty on pulpwood shipped to this country, and as the countervailing duty is levied to counteract such an export duty, undoubtedly the New Brunswick manufacturers will win their case. It will be remembered that the pulp manufacturers of Nova Scotia were successful in a similar contention recently. Apparently Quebec is to be the only sufferer among the Canadian provinces from the retaliatory action taken by the United States customs authorities.—Paper Mill.



PAPER STOCK MARKET.

The lack of water power, especially on small rivers, has become more pronounced. The demand for paper stock is very limited, and is chiefly for the various grades of waste paper, ground wood, etc., that take little power to prepare. The continued low price of woolen rags has tended to restrict the collecting of rags, and paper stock rags are in limited supply, with the exception of old bagging, which is held in large quantity.

Shipments of Manilla rope to the States have left this market (Montreal) for the present bare of this stock.

There is a fair supply of roofing paper stock, owing to the inability of most of the mills making this paper to grind their usual quantity of stock.

Quotations are the same as last month, except for Manilla rope, which is a little lower.

PERSONAL.

Edward Lloyd has been appointed Crown timber agent at New Liskeard, Ont.

Alexander McLean, of Ottawa, has been appointed commercial agent for Canada in Japan. Mr. McLean is best known as senior member of the firm of McLean & Roger, who published the Ottawa Times in the early seventies, and afterwards became contractors for parliamentary and departmental printing.



—The Incineration Committee of Montreal have inaugurated a project to obtain a revenue for the city from the lane and street garbage by advertising for tenders for the privilege of collecting the waste paper in the streets and lanes. A tender has been accepted from Louis Lebrun, of 1440 St. Denis Street, for \$555 a year. The conditions of the tender are:

1. This privilege comprises the exclusive right to pick up, during a period of forty-one months, from December 1, 1903, all the waste paper deposited in any part of the city, with the exception of the dumps and the incinerator site.
2. The waste paper deposited at any place in the city shall be picked up by the contractor before the house offal, garbage and refuse of any kind whatsoever are removed by the city; otherwise the waste paper may be removed by the said city at the same time as the garbage, as aforesaid, as such hour as it may deem proper, and in such case the contractor shall have no claim on said paper.



—The United States Bureau of Forestry has continued this year on a far larger scale the experiments in timber seasoning and preservation for the railroads which it began last year under Dr. Herman von Schrenk. The work will be carried on in many States, and will be broadened in scope. This work will be done for the New York Central, the Erie, the Baltimore and Ohio and the Pennsylvania Railroads in the East, and for the Illinois Central, the Santa Fe, the

St. Louis and San Francisco, the Missouri, Kansas and Texas, the Northern Pacific, and the Burlington in the South and West. The scarcity of valuable timber is felt by no class of consumers more keenly than by the railroads, which use every year 110,000,000 ties merely to renew those worn out and decayed. The price of timber has risen in some instances to a figure which makes its use prohibitive; in other cases the supply is so nearly exhausted that the roads have been compelled to look about for new timber. The Bureau of Forestry has been called on to assist in solving the difficulty, and has come forward with the practical and simple suggestion that the railroads, instead of continuing to use expensive, high grade timber for such a low grade purpose as that of railroad ties, shall use the cheaper woods, which can be treated with some kind of wood preservative.



—The Forestry School building of Yale University was destroyed by fire on December 12th. The loss is estimated at over \$100,000 on the building alone, while many fine specimens of plants and trees which cannot be replaced were destroyed.

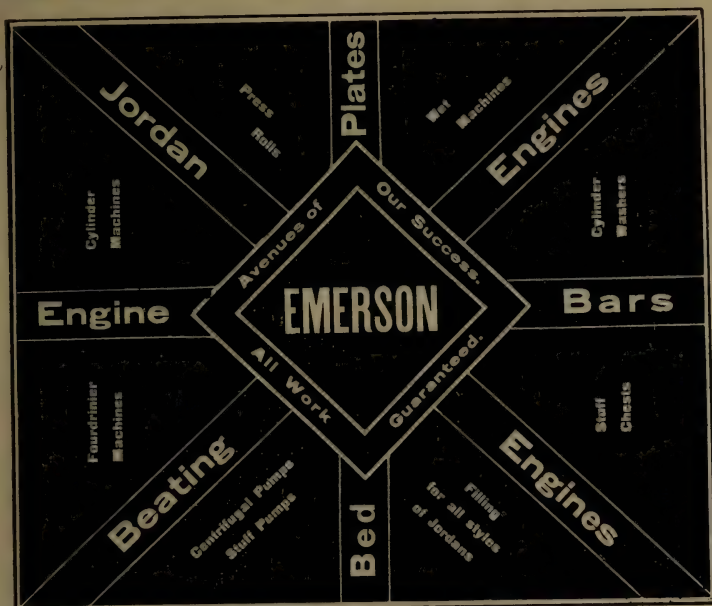


—The old Breck's woolen mill at Henry Clay, near Wilmington, Del., is being converted into a plant for the manufacture of paper barrels by the Du Pont company. It is said that the company will use these barrels for shipping powder.



—A syndicate, composed of J. J. McFadden, Sault Ste. Marie; Lorne Hale and F. J. Bell, Pembroke; John Ferguson, Renfrew; W. H. Lewis, Toronto; William Anderson, bookkeeper for J. R. Booth, Ottawa, has bought the mills at Sarnia and the limits in Algoma, covering 180 square miles, of the Edmund Hall estate. The price paid was \$850,000. The deal is one of the most important which has taken place in Ontario in recent years.

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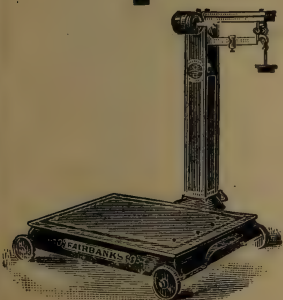
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MARKETS.

The prices for Canadian pulp for shipment to the United States have advanced \$1 a ton as anticipated in last issue. Owing, however, to restriction in the output of United States mills, the uncertainty of water conditions, and the advent of the holidays, very few contracts are being placed, and not much fresh business is looked for till the turn of the year, when it is anticipated that prices will advance. This anticipation is founded partly on the fact that less German and other foreign unbleached pulp is now going into the States, and the recent rains in the New England States have raised the rivers only temporarily, so that no improvement in pulp manufacturing conditions is likely to occur there. In ground wood an advance of \$1 to \$2 has taken place already, and the supply is likely to be short for some time among the Canadian mills owing to low water. For instance, in one river in Quebec 30,000 cords were

tied up by low water before the ice closed the river, and the mills tributary to this river have literally to "take to the woods." A buyer from the States has been through the Eastern Townships and Quebec districts offering \$7 for crossed wood, which means an advance of \$2 a cord over last year. If such offers are to become common it will mean a certain advance of \$2 on ground wood and \$3.50 on sulphite pulp. At Niagara Falls, N.Y., the other day \$12 a cord was paid for wood which last year cost \$9.50.

We learn from a good authority on the English pulp market that an understanding has been arrived at among the Scandinavian makers of mechanical pulp to restrict the total output by 25 per cent. Inasmuch as Canadian mills are now supplying Great Britain with about 25 per cent. of her total requirements in this line, it seems evident that Canada has displaced Scandinavia in the British market by that percentage. Some that the selling, by a combine, of Scandinavian products in the British market

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should have a steadying effect on the trade, if judiciously managed.

Canadian paper mills are now busy in all lines, and are likely to remain so while they are able to get supplies of pulp.

The Christiania correspondent of the Paper Maker reports that prices are very firm for best qualities of chemical pulp, and even lower grades are fetching more money. A healthier state of things is looked forward to for next year. The preparations for the establishment of a central selling bureau for mechanical pulp have had considerable effect on prices. Pulp makers are asking from 5 kr. to 6 kr. advance on present prices for next year. It is considered a wise move on the part of the Central Selling Bureau Committee to consent to the mills retaining their existing agents in the various countries in which they are represented.

Curtailment of production appears to be general in the United States paper trade. The Paper Products Co., a syndicate controlling about sixty mills, has

suggested to all its mill managers the closing of mills from December 19th to January 4th for repairs and stock taking. This action means the reduction of the output of board by about 19,000 tons. The restriction appears to be a movement in sympathy with the general contraction of industrial work in the States, which, however, is thought to be only a temporary check. The United States market in some lines of paper, such as tissue and writing, is still firm.



CHEMICALS.

London papers report hardening of prices in bleaching powder and rock brimstone. Farina has gone up suddenly, and a rise of over 30 per cent. is looked for in the next month. Sizing materials are steady and unchanged.

There are no special features in the New York chemical market, except that fresh arrivals of cargoes of brimstone have checked the demand, while the demand for alkali has increased.

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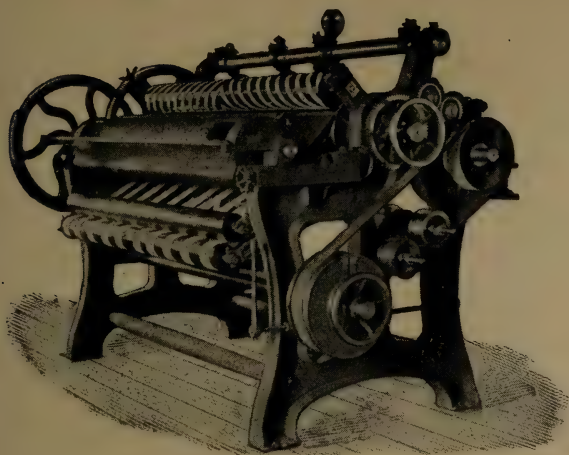
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BOILER NUMBER NINE 14' x 60"
 Number and size of tubes 64, 3½"
 Dome 36" x 36"
 Pressure allowed for next ten years, 100 lbs. per sq. in.

BOILER NUMBER EIGHTEEN, Twin
 shell, lower shell 14' x 60"
 Number and size of tubes 120, 3"
 Diameter of upper shell 30"
 Thickness of plates ¾"
 Double riveted.
 Pressure allowed, 80 lbs. per square inch.

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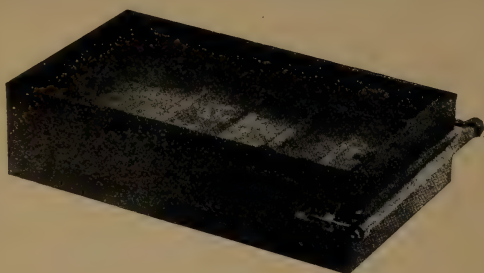
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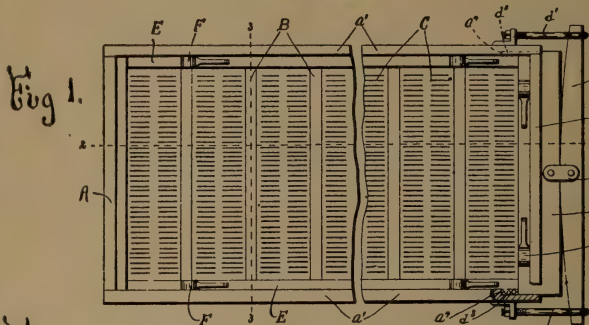
The Cushing Sulphite Fibre Co., Ltd., ST. JOHN, N.B.
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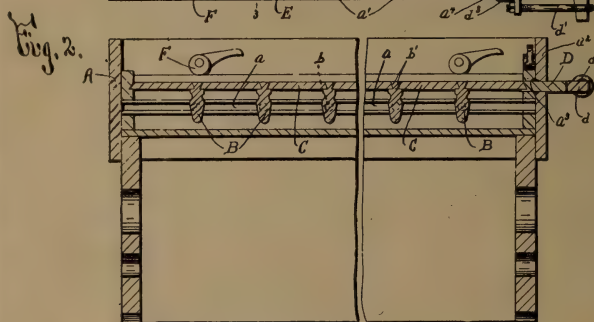
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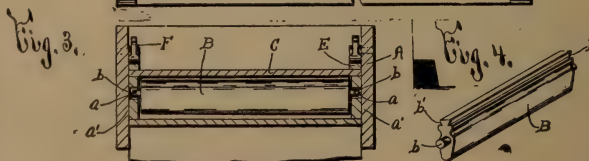


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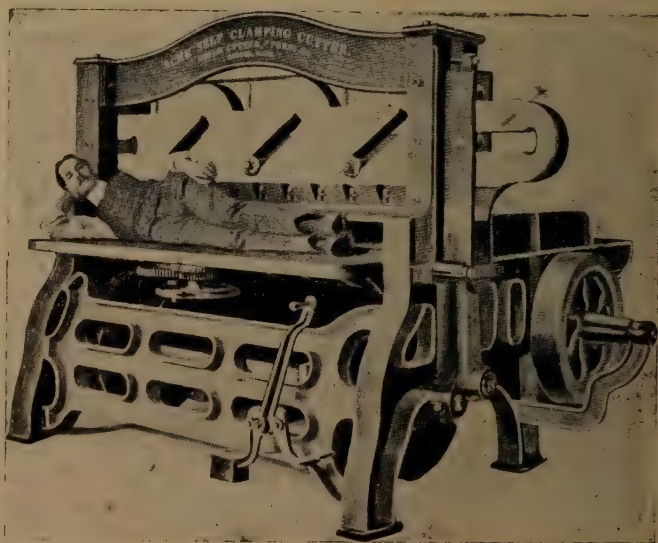
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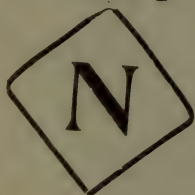
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